Acer Altos G900

User's guide

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Notices

FCC notice

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

Notice: Shield cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Notice: Peripheral devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class A limits may be attached to this equipment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.

Caution! Changes or modifications not expressly approved by the manufacturer could void the user’s authority, which is granted by the Federal Communications Commission, to operate this computer.

Use conditions

This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice: Canadian users

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Remarque à l'intention des utilisateurs canadiens

Cet appareil numérique de la classe A respected toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Laser compliance statement

The CD-ROM drive in this computer is a laser product. The CD-ROM drive's classification label (shown below) is located on the drive.

CLASS 1 LASER PRODUCT
CAUTION: INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.

Important safety information

Only a technically qualified person shall access, integrate, configure, and service this product.

Intended application uses

This product was evaluated as an Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other Product Categories and Environments (such as medical, industrial, alarm systems, and test equipment), other than as an ITE application, may require further evaluation.

Checking the power cords

Warning! To avoid electrical shock, do not attempt to modify or use the supplied AC power cord(s), if they are not the exact type required.

If a power cord(s) supplied is not compatible with the AC wall outlet in your region, get one that meets the following criteria:

- The power cord must be properly rated for the AC voltage in your region.
- The power cord plug cap must have an electrical current rating that is at least 125% of the electrical current rating of the product.
- The power cord plug cap that plugs into the wall socket-outlet must have a grounding-type male plug designed for use in your region.
- The power cord must have safety certifications for your region, and shall be marked with the certification markings.
- The power cord plug cap that plugs into the AC receptacle on the power supply must be an IEC 320, sheet C13, type female connector.
- In Europe, the power cord must be less than 4.5 meters (14.76 feet) long, and it must be flexible <HAR> (harmonized) or VDE certified cordage to comply with the chassis' safety certifications.
- The power supply cord(s) is the main disconnect device to AC power. The socket outlet(s) shall be near the equipment and shall be readily accessible for disconnection.

Multiple power cords

Warning! To avoid electrical shock, disconnect all AC power cords before accessing inside the system.

Earth grounded socket-outlets

Warning! To avoid electrical shock, the system power cord(s) must be plugged into socket-outlet(s) that is provided with a suitable earth ground.

Precautionary reminders

- Over current protection

  The system is designed to operate on a 20A AC voltage source that is provided with 20A over current protection. If the AC source for the rack exceeds 20A over current protection, each system must be provided with 20A or less over current supplemental protection. The supplementary over current protection must have the appropriate regional safety certifications for the over current application.
- Power supply modules

  Power supply modules have double-pole/neutral fusing.
- Ventilation considerations

  The equipment rack must provide sufficient airflow to the front of the system to maintain proper cooling. The rack selected and the ventilation provided must be suitable to the environment in which the system will be used.
- Fans

  To avoid injury do not touch moving fan blades.
- Cooling and airflow

  For proper cooling and airflow, always install all access covers before turning on the system. Operating the system for longer than five minutes without the covers in place can cause overheating and damage to system components.
- Temperature limits

  The operating temperature of the system, when installed in the rack, must not go below 10°C (50°F) or rise above 35°C (95°F). Extreme fluctuations in temperature may cause a variety of problems in system, and safety limits may be broken.
- Lifting and Moving

  Do not attempt to lift or move the server by the handles on the power supplies.

Equipment rack precautions

Follow the rack manufacturer's safety and installation instructions for proper rack installation.

The following additional rack safety installation measures shall be considered:

- Anchor the equipment rack

  The equipment rack must be anchored to an unmovable suitable support to prevent the rack from falling over when one or more systems are fully extended out of the rack assembly. You must also consider the weight of any other devices installed in the rack assembly. The equipment rack must be installed according to the manufacturer's instructions.
- Main AC power disconnect

  You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the system(s).
- Grounding the rack installation

  To avoid the potential for an electrical shock hazard, the rack assembly itself must be suitably earth grounded, according to your local regional electrical codes. This typically will require the rack to have its own separate earth ground. We recommend you consult your local approved electrician.

Important safety instructions

Read these instructions carefully. Save these instructions for future reference.

1. Follow all warnings and instructions marked on the product.
2. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
3. Do not use this product near water.
4. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
5. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.
6. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
7. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
8. If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
9. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
10. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.
11. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    a. When the power cord or plug is damaged or frayed
    b. If liquid has been spilled into the product
    c. If the product has been exposed to rain or water

d If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

e If the product has been dropped or the cabinet has been damaged

f If the product exhibits a distinct change in performance, indicating a need for service.

12 Replace the battery with the same type as the product's battery we recommend. Use of another battery may present a risk of fire or explosion. Refer battery replacement to a qualified serviceman.

13 **Warning!** Batteries may explode if not handled properly. Do not disassemble or dispose of them in fire. Keep them away from children and dispose of used batteries promptly. Dispose of used batteries according to manufacturer's instructions.

14 Use only the proper type of power supply cord set (provided in your accessories box) for this unit. It should be a detachable type: UL listed/CSA certified, type SPT-2, rated 7A 125V minimum, VDE approved or its equivalent. Maximum length is 15 feet (4.6 meters).

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1 System tour

This chapter gives you a tour of the system's internal and external components, as well as a discussion of its many features.

Features overview

The Acer Altos G900 four-way performance server model utilizes a PCI bus based mainboard built on an ATX form factor. It supports up to four processors from the Intel® Xeon™ processor family.

For expandability, the mainboard supports eight full length PCI slots (4 PCI-X hot plug, 2 PCI-X non-hot plug, 2 PCI non-hot plug). An impressive 12 GB maximum system memory is achieved through 12 DIMM sockets utilizing DDR-266 (Double Data Rate) modules.

Media drives include one 3.5-inch floppy drive, a CD-ROM drive, plus two 5.25-inch peripheral bays. The system also supports up to ten 1-inch hot-swap Ultra160 SCSI hard drives providing an additional 730 GB of storage space.

For connectivity, the mainboard provides two external USB (Universal Serial Bus) ports and one internal header providing one additional USB port, PS/2 interface for both mouse and keyboard, one VGA/monitor port, one external serial port and one internal serial port header, one parallel port with Extended Capabilities Port (ECP)/Enhanced Parallel Port (EPP) support, and for networking, two NIC ports (RJ-45).

Power supply is provided by the three hot-swap power supply modules in a 2+1 redundant configuration (third module optional).

In terms of serviceability, the system features front access to hot-swap hard disk drives, rear access to hot-swap power supplies, and side access to hot-plug PCI boards and hot-swap fans. Serviceable items are color coded throughout and detailed configuration labels are located on the system's side panel. Fault indicators and system UID (Unit ID) light are also available.

Manageability features include compliance to both IPMI 1.5 and WfM 2.0 standard, extensive system sensors and monitoring, as well as function for remote management and diagnostics via the serial or LAN port. External chassis management is done via ICMB.

Altos G900 physical specifications

Specification	Rack-mount orientation	Tower orientation
Height	12.25 inches (311 mm) (7U)	18.09 inches (459 mm)
Width	Fits 19-inch rack	12.24 inches (311 mm)
Depth	25.25 inches (641 mm)	25.25 inches (641 mm)
Weight		
Minimum configuration	90 pounds (41 kg)	96 pounds (44 kg)
Maximum configuration	119 pounds (57 kg)	125 pounds (57 kg)
Required front clearance	3 inches (76 mm), inlet airflow <35 °C (95 °F)	12 inches (305 mm)
Required rear clearance	4.5 inches (114 mm), no airflow restriction	9 inches (229 mm)
Required side clearance	0 inch (0 mm)	0 inch (0 mm)
Power requirements		
Voltage (110)	90 Vrms min, 132 Vrms max, 9 Arms	90 Vrms min, 132 Vrms max, 9 Arms
Voltage (220)	180 Vrms min, 264 Vrms max, 4.5 Arms	180 Vrms min, 264 Vrms max, 4.5 Arms
Frequency	47 Hz min, 63 Hz max	47 Hz min, 63 Hz max

Note: Amperage values indicated on this section is based on total system power, with two or three power supply modules installed. For detailed information on calculating power consumption for specific server configurations, see page 198.

External and internal structure

Access covers

The figure below shows the system’s access panels

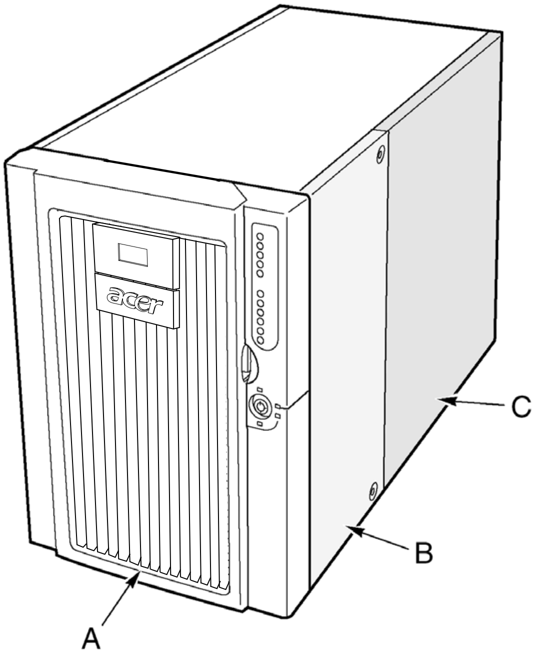


Figure 1 - Access covers

Label	Description
A	Bezel
B	Front access panel
C	Rear access panel

Main chassis components

The figure below shows the chassis with the access panels removed.

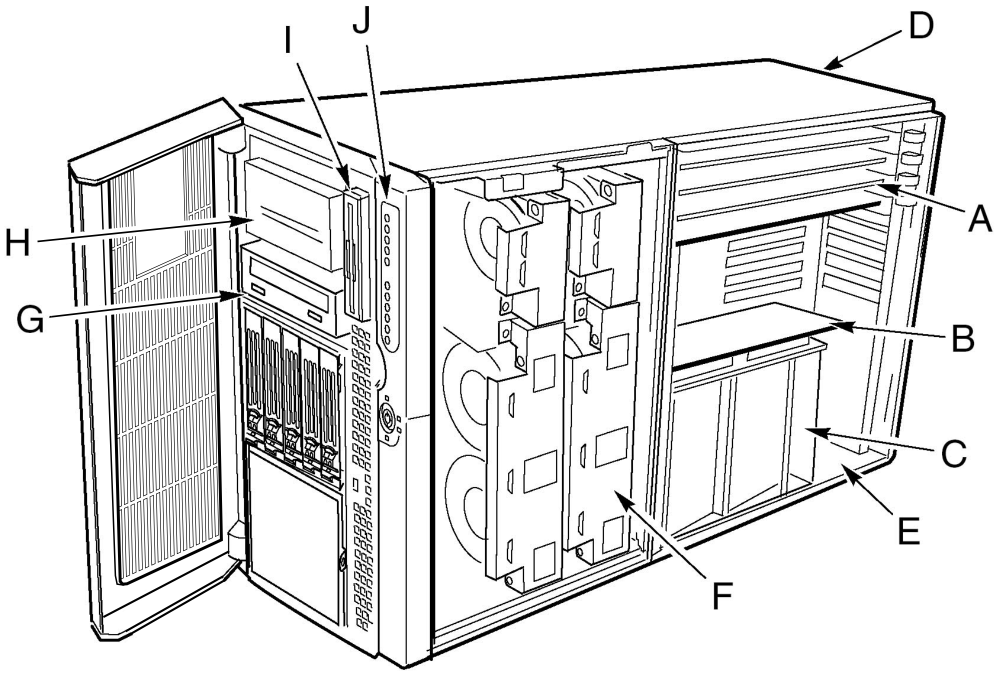


Figure 2 - Main chassis components

Label	Description	Label	Description
A	Hot-plug PCI add-in cards	F	Fan bay
B	Memory board	G	CD-ROM drive
C	Processor board air baffle	H	5.25-inch peripheral bay
D	Power supply bay	I	3.5-inch diskette
E	Electronics bay	J	Front control panel

Electronics bay components

The figure below shows the electronics bay with the access cover, memory board, and air baffle removed.

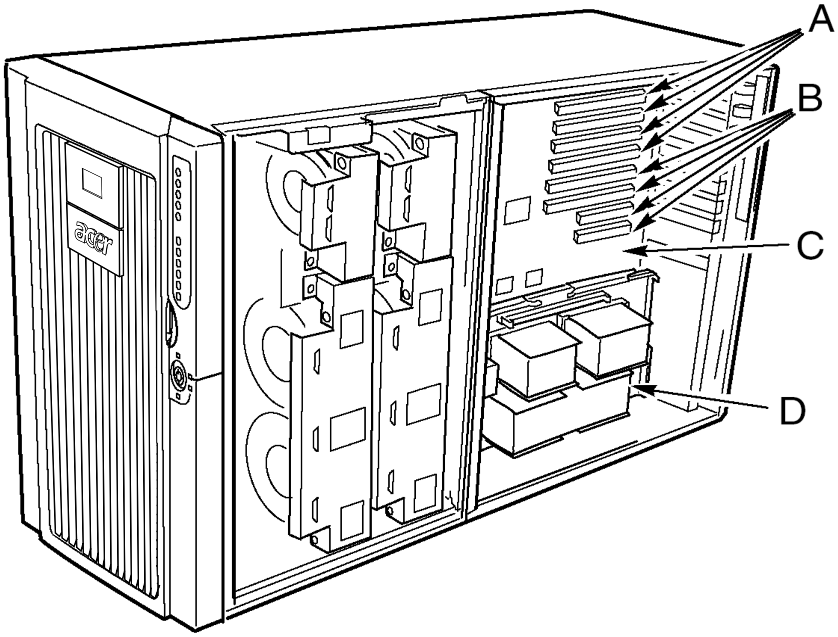


Figure 3 - Electronics bay components

Label	Description	Label	Description
A	Hot-plug PCI slots	C	Mainboard
B	Non-hot-plug PCI slots	D	Processor board

Front control panel

The figure below describes the features of the front control panel.

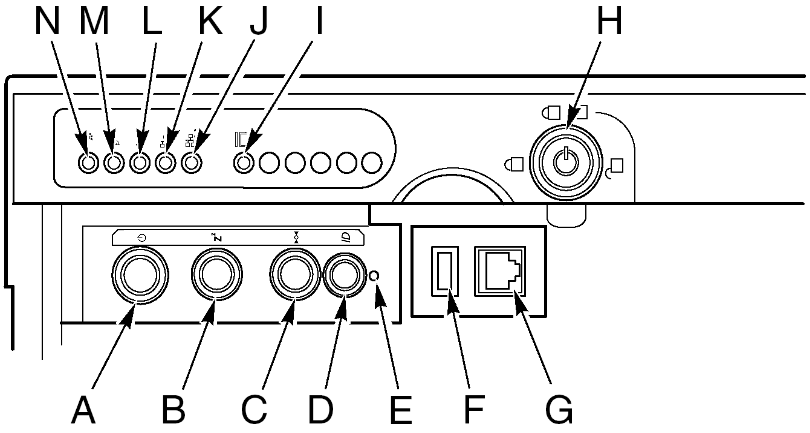


Figure 4 - Front control panel

Label	Description	Operation
A	Power button	To turn power on, press the power button momentarily. If the system is in sleep state, pressing the power button momentarily brings the system out of the sleep state. To turn power off, press and hold the power button for more than four seconds. This overrides ACPI mode.
B	Sleep button	To put a system supporting ACPI into sleep mode (S1), press the sleep button momentarily. To wake a system from sleep mode, press the sleep button momentarily.
C	Reset button	To reset the system, press the reset button momentarily. To clear CMOS, press and hold the reset button for at least four seconds, and then press the power button. Release both the reset and power buttons at the same time. The system will power on and the CMOS will be reset.
D	Chassis ID button	Illuminates LEDs on both the front and rear of the chassis, simplifying identification of the chassis in a rack from the rear.

Label	Description	Operation
E	NMI switch	Causes a non-maskable interrupt. Located behind the bezel door.
F	USB connector	USB port 3. Located behind the bezel door.
G	Serial port connector	Serial port B. Located behind the bezel door.
H	Lock	Locks the bezel and front access cover.
I	Chassis ID LED	Blue indicates chassis ID is active.
J	LAN2 LED	Green indicates LAN2 activity.
K	LAN1 LED	Green indicates LAN1 activity.
L	Hard drive activity LED	Green indicates system hard drive activity.
M	Fault LED	Red indicates any system fault condition.
N	Main power LED	Solid green indicates the presence of DC power in the server. Flashing green indicates that the system is in ACPI sleep mode.

Rear panel

The figure below describes the features of the rear panel.

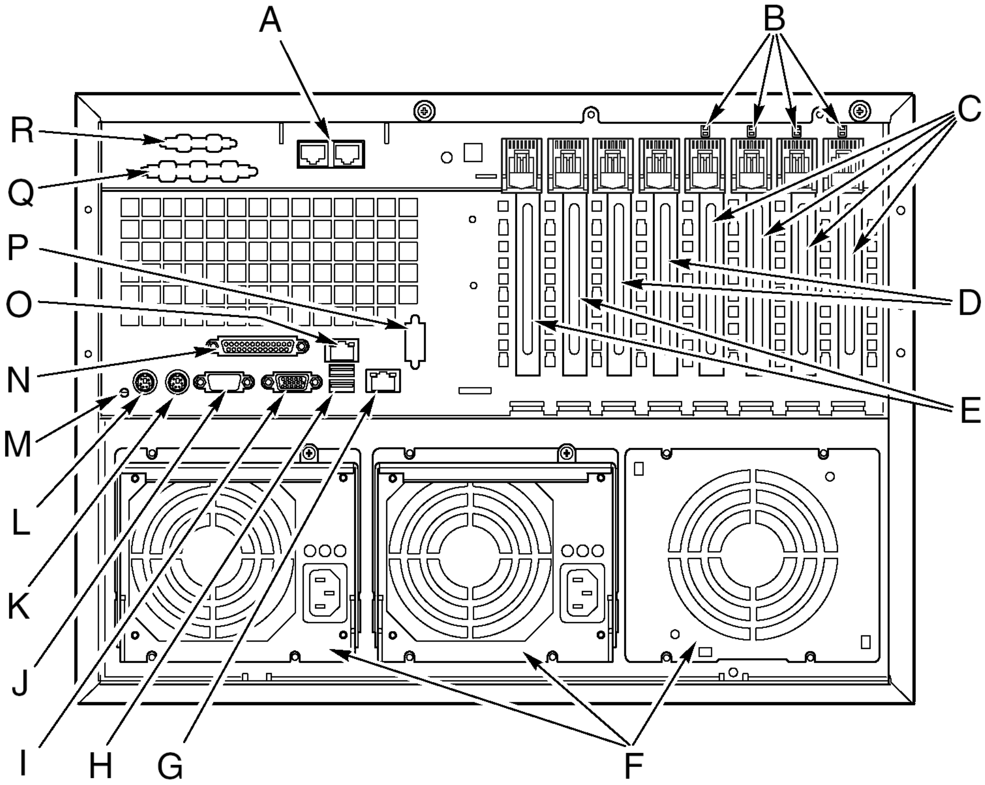


Figure 5 - Rear panel

Label	Description
A	Optional ICMB ports 1 (left) and 2 (right)
B	Hot-plug PCI LEDs
C	Hot-plug 64-bit, 66 MHz PCI-X add-in card slots
D	Non-hot-plug 64-bit, 100 MHz PCI-X add-in card slots
E	Non-hot-plug 32-bit, 33 MHz PCI add-in card slots
F	Power supply bays
G	LAN2 Gbit RJ-45 connector
H	USB ports 0 (upper) and 1 (lower)

Label	Description
I	Video connector
J	Serial port A
K	PS/2-compatible mouse port
L	PS/2-compatible keyboard port
M	Chassis ID LED
N	IEEE 1284 Enhanced Parallel Port
O	LAN1 100/10 RJ-45 connector
P	Knockout for optional serial port B
Q	Knockout for optional SCSI connector
R	Knockout for optional VHDCI SCSI connector

Peripheral device bay

Opening the right bezel door provides access to the peripheral bay. The peripheral bay consists of four bays for removable media:

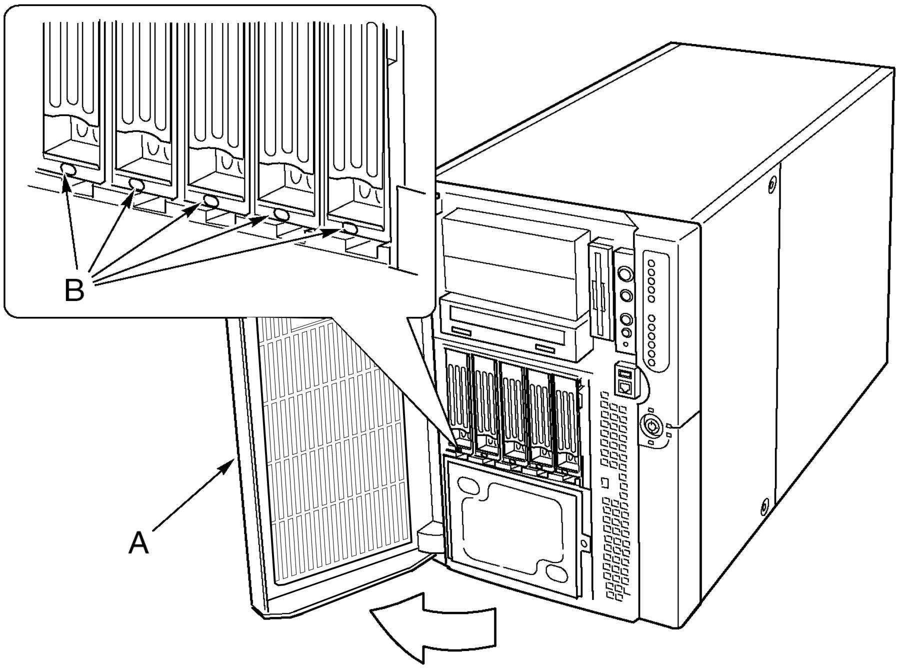


Figure 6 - Peripheral device bay

Label	Description	Label	Description
A	Front bezel door	B	LED status indicators

Caution! It is not recommended to install a hard disk drive in the 5.25-inch bay, because of potential cooling and electromagnetic interference (EMI) constraints.

Server board set features

The server board set for Altos G900 consists of a mainboard, memory board, and processor board.

Mainboard layout

Below illustration identifies the connectors and major components on the Altos G900 mainboard.

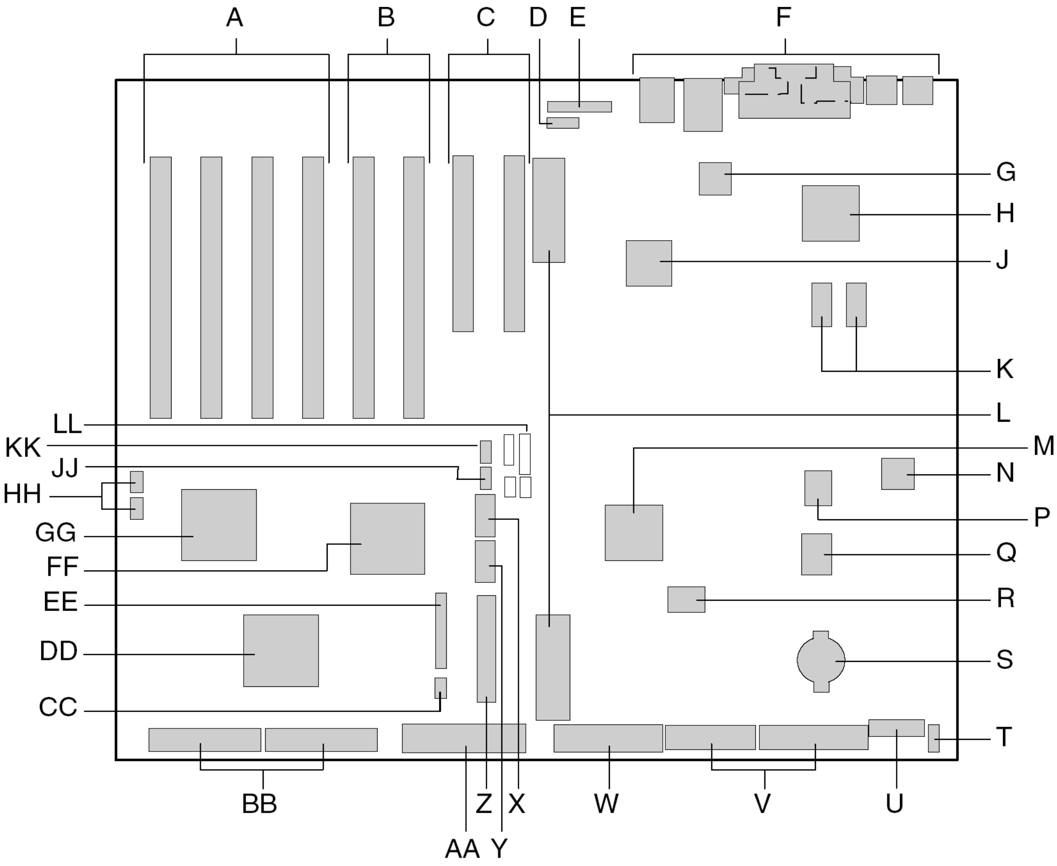

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W
X
Y
Z
AA
BB
CC
DD
EE
FF
GG
HH
JJ
KK
LL

Figure 7 - Mainboard layout

Label	Description
A	64-bit, 66-MHz, hot-plug PCI-X slots
B	64-bit, 100-MHz, non-hot-plug PCI-X slots

Label	Description
C	32 bit, 33-MHz, non-hot-plug PCI slots
D	Intelligent Chassis Management Bus (ICMB) connector (P24)
E	Hot-plug indicator board (HPIB) connector (P23)
F	Back panel I/O connectors
G	Intel® 82550 Ethernet controller
H	ATI Rage XL 2D/3D graphics accelerator
J	Intel® 82544 Ethernet controller
K	Video RAM (VRAM) (4 MB total)
L	Processor board connectors (P21 and P22)
M	ServerWorks south bridge controller (CSB5)
N	BMC component
P	BIOS Flash component
Q	PC87417 Super I/O controller
R	BMC Flash component
S	Battery
T	Chassis intrusion detect connector (P36)
U	14-pin power control connector (P35)
V	24-pin power connector (P32)
W	20-pin power connector (P28)
X	Floppy disk drive connector (P25)
Y	Serial port B connector (P17)
Z	USB port 3 header (P18)

Label	**Description**
AA	Front panel header (P19)
BB	IDE connector (P13)
CC	SCSI LVD connectors (P4 and P7)
DD	Intelligent Platform Management Bus (IPMB) connector (P12)
EE	Adaptec 7899 SCSI controller
FF	Fan connector (P11)
GG	ServerWorks PCI-X bus bridge controller (CIOB30)
HH	ServerWorks PCI-X bus bridge controller (CIOB30)
JJ	RAID LED connectors (P1 and P2)
KK	Hot-swap backplane (HSBP) connector (P16)
LL	Secondary HSBP connector (P15)
MM	Jumpers

Mainboard jumpers

Jumpers on the mainboard are organized into three groups:

- Boot block jumpers (JP3)
- Main jumpers (JP4, JP5, and JP6)
- Serial port B jumpers (JP25).

The figure below identifies the jumper blocks and pin numbers. The function of each pair of pins is described in the sections that follow.

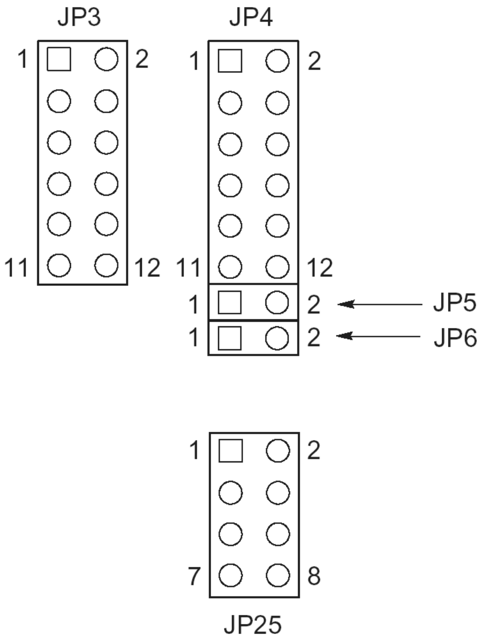


Figure 8 - Mainboard jumpers

Boot block jumpers

The boot block jumpers are used when updating the BIOS or BMC firmware in the unusual event that the boot block area needs to be updated. These jumpers are not used for routine firmware updates. Use the boot block jumpers only when the instructions with a firmware update specifically say to do so. When you do need to enable either of these features, use one of the spares from JP4 pins 1 and 2 or JP25 pins 7 and 8. The table below identifies the function of each pin pair on JP3.

Jumper block	Pins	Jumper name - effect when shorted
JP3	1-8	Reserved.
	9-10	BMC Boot Block Write Enable - Allows the BMC boot block to be overwritten when updating the BMC firmware.
	11-12	BIOS Boot Block Write Enable - Allows the BIOS boot block to be overwritten when updating the BIOS.

Main jumpers

Below table identifies the function of each pin pair on the main jumper blocks (JP4, JP5, and JP6). The FRB3 Timer Disable jumper and the BMC Force Update jumper are special purpose jumpers that you should use only when instructed to do so. When you do need to enable any of these features, use one of the spares from JP4 pins 1 and 2 or JP25 pins 7 and 8.

Jumper block	Pin	Jumper name - effect when shorted
JP4	1-2	Spare
	3-4	BIOS Recovery - System will attempt to recover the BIOS at the next boot.
	5-6	Reserved
	7-8	Reserved
	9-10	Password Clear - User and administrator passwords are cleared at the next boot.
	11-12	CMOS Clear - CMOS settings are cleared at the next boot.
JP5	1-2	FRB3 Timer Disable - Disables fault resilient boot timer 3.
JP6	1-2	BMC Force Update - Lets a system with corrupted BMC firmware boot for an update.

Serial port B jumpers

The table identifies the function of each pin pair on the serial port B jumper block (JP25). By default, the serial port B connector is an RJ-45, which has only eight pins and doesn't provide separate DCD and DSR signals. The serial port B jumpers let you configure the DSR and DCD signals passed from the port connector to the inputs of the UART. The default configuration has jumpers installed on pins 1 and 2 and on pins 3 and 4.

Caution! Never install jumpers on pins 3 and 4 and on pins 5 and 6 at the same time. This would cause both the DCD and DSR signals from the connector to drive the DCD input on the UART, resulting in signal contention.

Jumper block	Pin	Jumper name - effect when shorted
JP25	1-2	DSR to DSR - DSR from connector is passed to DSR input on UART (RJ-45 & DB9).
	3-4	DSR to DCD - DSR from connector is passed to DCD input on UART (RJ-45 only).
	5-6	DCD to DCD - DCD from connector is passed to DCD input on UART (DB9 only).
	7-8	Spare.

System cables

This section shows the correct routing of cables from the mainboard to the front subchassis

Caution! To avoid possible damage to the cables or internal components, the cables must be routed as shown in the following illustrations.

Figure 9 shows the routing of cables from the mainboard to the front subchassis components.

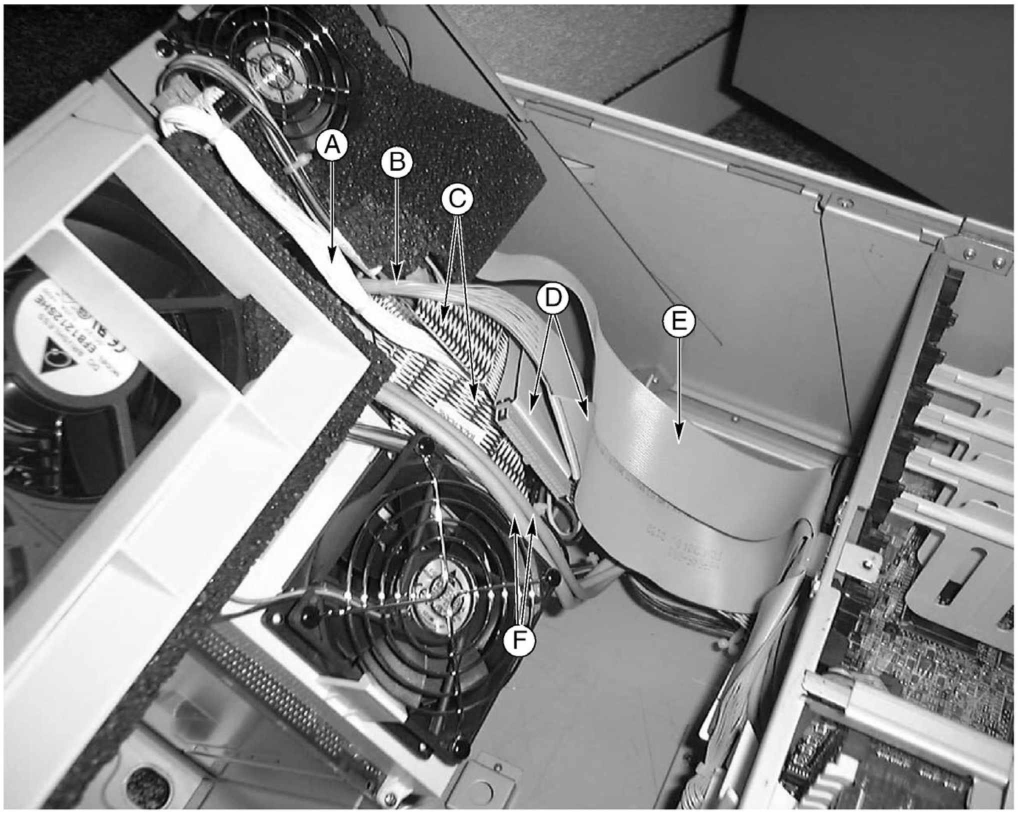


Figure 9 - Cables to the subchassis

Label	Description	Label	Description
A	Fan distribution board cable	D	IDE peripheral cable
B	Front panel board cable	E	Diskette drive cable

Label	Description	Label	Description
C	SCSI hard drive cable	F	Serial port B cables

Figure 10 shows the routing of ribbon cables through the cable clamp. Additional cables are routed behind these ribbon cables as shown in Figure 11.

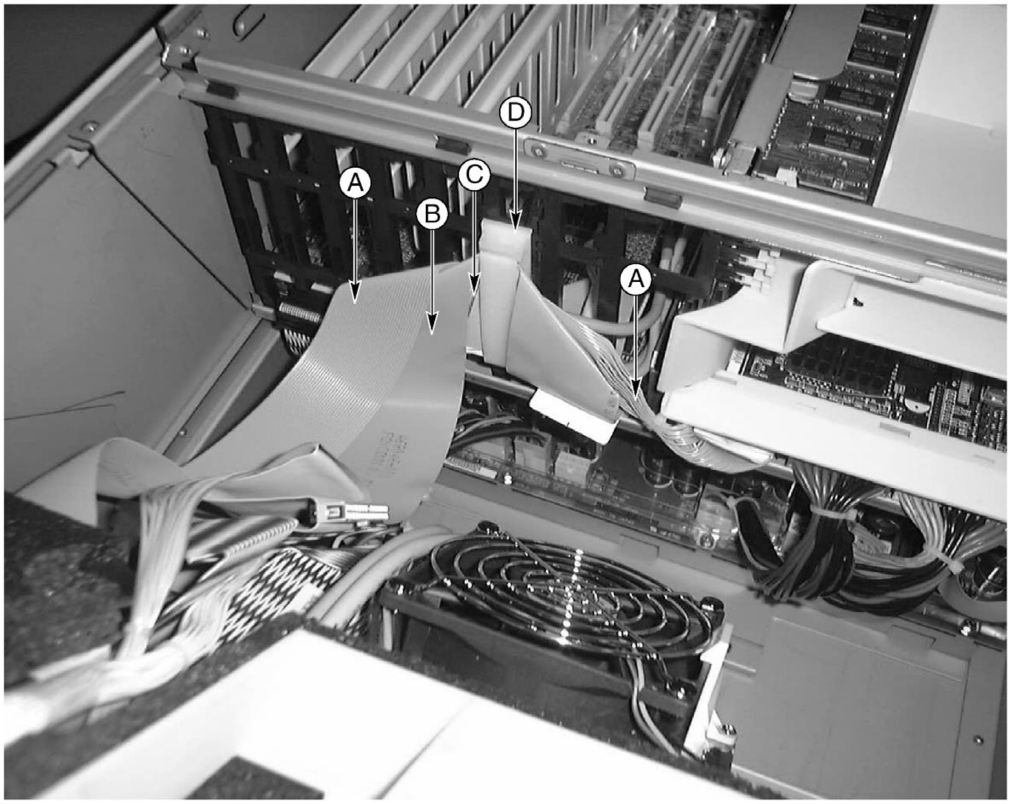


Figure 10 - Front cables in the cable clamp

Label	Description	Label	Description
A	Diskette drive cable	C	Front panel board cable
B	IDE peripheral cable	D	Cable clamp

Finally, Figure 11 shows the routing of the cables at the back of the cable clamp, behind the ribbon cables.

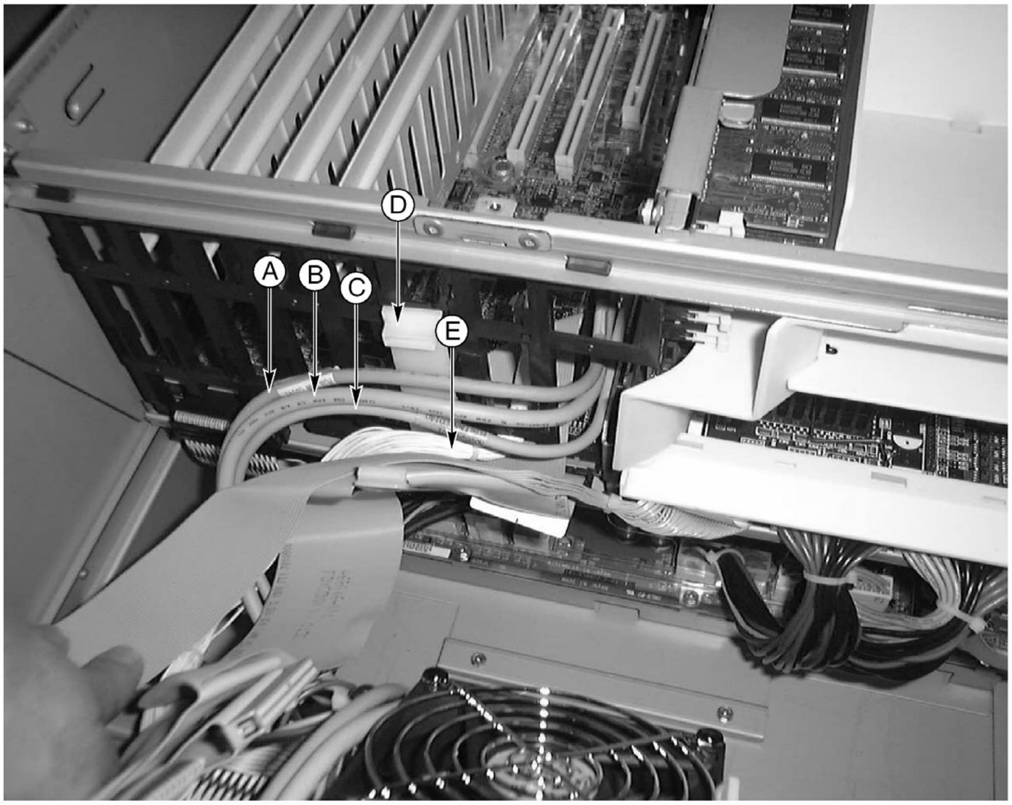


Figure 11 - Rear cables in the cable clamp

Label	Description
A	Front panel cable
B	Serial port B cable
C	Hot-swap back plane cable
D	Cable clamp
E	Fan distribution board cable

System features

The Altos G900 is a powerful server system loaded with a host of new and innovative features. The system offers a new standard for flexible productivity ideal for general business applications, email, web service, file clustering and print services.

Processors

The Altos G900 server accommodates one to four processors from the Intel® Xeon™ processor family.

Memory

The memory board contains twelve 168-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered PC-266 Double Data Rate (DDR) DIMMs. Memory is partitioned in three banks. You may install a minimum of 512 MB (128 MB x 4) or as much as 12 GB.

- Minimum configuration: Four 128-MB DIMMs, for a total of 512 MB
- Maximum configuration: Twelve 1-GB stacked DIMMs for a total of 12 GB

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

SCSI controller

The mainboard includes an embedded Adaptec® 7899 SCSI controller, which contains two independent SCSI channels. You can disable the SCSI controller in BIOS setup. Both channels support 16-bit SE or LVD SCSI operations at the following speeds:

- Ultra160 (160 MB/sec)
- Ultra2 (80 MB/sec)
- Ultra Wide SE (40 MB/sec)

The mainboard provides active terminators, termination voltage, resettable fuses, and protection diodes for both SCSI channels. You can disable the onboard terminators in BIOS setup.

Onboard video

The mainboard incorporates an ATI RAGE XL PCI graphics accelerator with 4 MB of video SDRAM that supports all standard IBM VGA modes. The embedded SVGA video subsystem supports:

- Pixel resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The mainboard supports disabling of the onboard video through BIOS setup or when a plug-in video card is installed in any of the PCI slots.

Network interface controllers

Note: To ensure EMC product regulation compliance, the system must be used with shielded LAN cables.

The mainboard includes two network interface controllers (NICs):

- Intel® 82550 NIC that supports 10Base-T and 100Base-TX networks

  The 82550 controller supports the following features:

  - 32-bit PCI, CardBus master interface
  - Integrated IEEE 802.3 10Base-T and 100Base-TX compatible PHY
  - IEEE 820.3u auto-negotiation support
  - Chained memory structure similar to the 82559, 82558, 82557 and 82596
  - Full duplex support at both 10 Mbps and 100 Mbps operation
  - Low power +3.3 V device
  - IP checksum off-loading

  NIC 1 can be used as both a network interface and server management interface.

- Intel® 82544 NIC that supports 10Base-T, 100Base-TX networks, and 1000BASE-T networks

  The 82544 controller supports the following features:

  - Direct 32/64-bit, 33/66-MHz interface to the PCI bus
  - Integrated IEEE 802.3 1000BASE-T, 100BASE-TX, and 10BASE-T
  - Integrated third-generation MAC and proven IEEE 803.3ab compatible PHY
  - Full duplex support for 10-Mbps, 100-Mbps, and 1000 Mpbs operation
  - Descriptor ring management architecture optimized to deliver both high performance and PCI/PCI-X bus efficiency
  - Low power +3.3 V device
  - IP and TCP/UDP checksum off-loading

Hot-swap hard drive bays

The server comes with one hot-swap hard drive cage installed. A second bay is available as an accessory. The hard drive bays each support up to five 3.5-inch by 1.0-inch Ultra160 SCSI hard drives. The hard drive bays also support SCSI hard drive technologies, such as Ultra2, that are slower than the Ultra160 SCSI technology.

Each hard drive is connected to an Adaptec® Ultra160 SCSI hot-swap backplane. The backplane provides 80-pin SCA-2 connectors for each hard drive and accepts 15,000 RPM and slower SCSI hard drives that consume up to 20 watts of power.

Opening the bezel door provides access to the hard drives. To allow hot swapping, each hard drive mounts in a hard drive carrier. When a hard drive is removed from the system, both the carrier and the hard drive are removed.

Caution! Because all hard drives have different cooling, power, and vibration characteristics, specific hard drive types has been validated to be compatible with the Altos G900 system.

Power supply

The power supply bay comes with two 600-W power supply modules and can accommodate a third module for redundancy. The modules connect through the power distribution board (PDB) and auto-sense input voltage. The power redundant (2+1) configuration allows you to hot-swap a failed power supply without interrupting normal system operation.

Warning! The power supply in this product contains no user-serviceable parts. There may be more than one power supply in this product. Refer servicing only to qualified personnel.

System fan

Caution! All access covers must be on the system for proper cooling.

To ensure that all components remain within specification under all system environmental conditions, do not exceed five minutes for hot swapping of fans or power supplies.

The server comes with four fan modules. Air enters through the bezel, passes through the fan bay and electronics bay, and exhausts through the rear of the chassis. The power supply modules and hot-swap hard drive bays also come with their own fans which draw air through those components and through the peripheral bays.

Under normal system conditions, the fans run at a slower, quieter speed. If a fan failure is sensed, a fan is not detected, or ambient temperature exceeds a certain limit, the fan speed is set to high.

LEDs indicate if individual fans are inoperative or not present. Under the same fan failure conditions, the general system fault LED on the front panel is lit.

ACPI

The server supports the Advanced Configuration and Power Interface (ACPI) standard as defined by the ACPI 1.0b and PC97 specifications. An ACPI-aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The server supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.
- s1: Processor sleep state - No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk - The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off - Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the operating system or hardware.

Caution! The system is off only when the AC power cord is disconnected.

2 System setup

This chapter describes the system setup procedures — both for hardware and software aspects.

Getting started

Checking for damage to the packaging

Inspect the packaging container for evidence of mishandling during transit. If the packaging container is damaged, photograph it for reference. Save the packaging container and packing materials in the event you need to package the server for reshipment.

Selecting a site

Before unpacking and installing the system, select a suitable site for the system for maximum efficiency. Consider the following factors when choosing a site for the system:

- Near a properly grounded, three-pronged power outlet

Note:
In the United States and Canada: a NEMA 6-15R outlet for 100-120 V and for 200-240 V.
In other geographic areas: a properly grounded outlet in accordance with the local electrical authorities and electrical code of the region.

- Clean and dust-free
- Stable surface free from vibration
- Well-ventilated and away from sources of heat, with the ventilation openings on the server kept free of obstructions
- Secluded from strong electromagnetic fields and noise caused by electrical devices such as elevators, copy machines, air conditioners, large fans, large electric motors, radio and TV transmitters, and high-frequency security devices.
- Maximum ambient air temperature should not exceed 35°C (95°F).
- Access space provided so the server power cords can be unplugged from the power supply or the wall outlet; this is the only way to remove AC power from the server.

- Clearance provided for cooling and airflow.

Note: Surge suppressor recommended: In geographic regions that are susceptible to electrical storms, it is strongly recommended that you plug the server into a surge suppressor.

Checking the package contents

Remove the server from the packaging container and, using the list below, check that all parts and accessories are included. Inspect the server and accessories for damage. If any of the contents appear damaged, file a damage claim with the carrier immediately.

The Altos G900 system comes with the following parts installed:

- System components
    - Altos G900 mainboard
    - Altos G900 processor board
    - Altos G900 memory board
    - Fan distribution board
    - Front panel board
    - Hot plug indicator board
    - Power distribution board
    - Two 600-W power supplies
    - Six fan modules
    - 3.5-inch floppy drive
    - 5.25-inch CD-ROM drive
    - 1-inch hard disk drive bay
    - Bezel and feet for tower
    - Three sets (six rails) 5.25-inch peripheral rails and screws
    - Two North American power cords
    - System accessory box

  - System keys (provided inside the system accessory box)
  - Additional parts or components depending on specific system configuration.
- System documentation
  - Acer Altos G900 User's guide (with system binder)
  - Acer EasyBUILD™ v5.1 CD - contains product documentation, device drivers, and software utilities, includes three discs:
    - Management CD
    - System CD
    - Resource CD

If any of the above items are damaged or missing, contact your dealer immediately.

Save the boxes and packing materials for future use

Setting up your system

Setup reminders

- Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.
- The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply. The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.

Pre-setup safety steps

Whenever you remove the chassis panels to access the inside of the system, follow these steps:

1. Turn off all peripheral devices connected to the system.
2. Turn off the system by pressing the power button.
3. Unplug all AC power cords from the system or from wall outlets.
4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system.
5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system—any unpainted metal surface—when handling components.
6. Do not operate the system with the chassis panels removed.

After you have completed the six steps above, you can remove the chassis panels. To do this:

1. Unlock and remove the padlock from the back of the system if a padlock has been installed.
2. Remove and save all screws from the panels.
3. Remove the panels.

For proper cooling and airflow, always reinstall the chassis panels before turning on the system. Operating the system without the these panels in place can damage system parts. To install the chassis panels:

1 Check first to make sure you have not left loose tools or parts inside the system.
2 Check that cables, add-in boards, and other components are properly installed.
3 Attach the panels to the chassis with the screws removed earlier, and tighten them firmly.
4 Insert and lock the padlock to the system to prevent unauthorized access inside the system.
5 Connect all external cables and the AC power cord(s) to the system.

Hardware setup

The server is shipped without processors, memory, or hard drives. To install the memory, processors, hard drives, and other options, follow the steps shown below.

1 Removing the system access panels:
    a Removing the rear access panel - see page 44
    b Removing the access cover to the system boards - see page 51
2 Removing the memory and processor boards:
    a Removing the memory board - see page 52
    b Removing the air baffle - see page 54
    c Removing the processor board - see page 55
3 Installing memory and processors:
    a Installing the DIMMs on the memory board - see page 62
    b Installing the processors on the processor board - see page 66
4 If you are installing an ICMB board - follow the instructions that came with the ICMB board kit.
5 Installing the processor and memory boards:
    a Installing the processor board - see page 56
    b Installing the air baffle - see page 54
    c Installing the memory board - see page 53
6 Installing PCI add-in cards - see page 69
7 Installing hard disk drives - see page 80

8 Installing an additional power supply or additional peripherals - see page 86, page 98, and any additional documentation that came with the peripherals.

9 Reinstalling the system access panels:
   a Installing the access cover to the system boards - see page 52
   b Installing the rear access panel - see page 45

You have completed the hardware setup. The remainder of this section discusses software setup and configuration. Refer to page 36.

Turning on the server and running the Power-On Self Test (POST)

Each time you start the server, the Power-On Self Test (POST) runs automatically. POST is stored in flash memory.

To start the server, do the following:

Note: To access certain features, such as BIOS setup, you must press specific keys at specific times during POST. To familiarize yourself with this procedure, read the following instructions completely before actually performing them. For a summary of hot keys active during POST, see page 35.

1 Make sure all external devices, such as a monitor, keyboard, and mouse, are connected.

2 If a drive protection card or diskette is present in the diskette drive, remove it.

3 Plug the video monitor power cord into the power source or wall outlet. Turn on the video monitor.

4 Plug the AC power cords into the power connectors on the back of the chassis and into the power source or wall outlet.

5 If the server does not turn on when you plug it into the AC outlet, press the on/off power button on the front panel.

6 Verify that the main power LED on the front panel is lit.

   After a few seconds, POST begins and a splash screen is displayed (if the splash screen is disabled in BIOS setup, a diagnostics screen is displayed). POST discovers, configures, and tests the processors, memory, keyboard, and most installed peripheral devices. The length of time needed to complete POST depends on the amount of memory installed and the number of option boards installed.

7 Shortly after the splash screen is displayed, POST displays the message "Press <F2> to enter Setup…" at the bottom of the screen. At this point, you can press any of the keys identified with an asterisk (*) on the following table, or you can do nothing and wait until the server boots from the CD-ROM.

If you enter BIOS setup, the service partition, or the Adaptec® SCSI*Select* utility, when you exit those features, the server might reboot.

8 After POST completes, the system beeps once and then searches all boot devices in the order defined by the boot priority settings in the BIOS. The system finds, loads, and runs the limited operating system on the System CD.

If there is no device with a bootable operating system, the boot process continues, the system beeps once, and the following message is displayed:

```
Operating system not found
```

If you have a device with a bootable operating system but see this message anyway, reboot and use BIOS setup to make sure your boot device settings are correct.

Hot keys for POST

The table below lists the hot keys you can use during POST to access setup utilities and alter the normal POST execution.

Items marked with an asterisk (*): Press any of these keys when the prompt "Press <F2> to enter Setup…" is displayed.

To do this:	Press these keys:
Abort memory test during POST.	Space Press while BIOS is updating memory size on screen.
Resume after a POST error is displayed. (The system pauses after displaying an error.)	F1
Enter BIOS setup during POST.	F2 *

To do this:	**Press these keys:**
Boot to the service partition.	F4 *
Boot from a network using Preboot Execution Environment (PXE).	F12 *
Remove the splash screen to view the diagnostic messages during POST and display a menu for selecting the boot device.	ESC * Using BIOS setup, you can enable the Boot-Time Diagnostic Screen, in which case POST does not display the splash screen. If you use the displayed menu to change the boot device, the change affects the current boot only.
Enter the Adaptec SCSI*Select* utility during POST.	Ctrl+A *

Software setup

Installing the service partition (recommended)

When you are setting up your server system, you can install a service partition on your hard drive. To create a service partition, follow the related instructions that appears when installing the system OS using the System CD. The service partition, in conjunction with Acer Server Management Enterprise (ASMe), provides emergency remote management and remote server setup. The service partition lets you remotely access a local partition on the server and identify and diagnose server health issues by using either a modem or network connection. The service partition uses approximately 30 to 40 MB of hard disk space.

Installing the operating system

The System CD contains a limited operating system with enough functionality to boot the server and to copy and use the utilities and other files from the CD. This limited operating system is not intended to be used to run applications. To run your server and applications, you must install the operating system of your choice on the server. Follow the installation instructions that came with the operating system.

Network teaming features

NIC connector and status LEDs

The NICs drive LEDs on the network interface connectors that indicate link connection and activity on the LAN and 10- or 100-Mbps operation. The green LED indicates network connection when on and TX/RX activity when blinking. The yellow LED indicates 100-Mbps operation when lit.

Note: Using both onboard NICs in a team does not allow the use of NIC 1 for server management access. To support both network teaming features and server management features, a third NIC must be added and teamed to NIC 2.

The network controller provides several options for increasing throughput and fault tolerance when running Windows, NetWare, or Linux:

- Adapter Fault Tolerance (AFT)

  Provides automatic redundancy for your adapter. If the primary adapter fails, the secondary takes over. AFT works with any hub or switch.

- Adaptive Load Balancing (ALB)

  Creates a team of two to eight adapters to increase transmission throughput and includes AFT. Works with any 10Base-TX or 100Base-TX switch.

- Fast EtherChannel (FEC) or Intel® Link Aggregation

  Creates a team of up to eight adapters to increase transmission and reception throughput and includes AFT. Requires a FEC-enabled switch.

To set up an option, read the instructions in the Windows or NetWare readme files.

Considerations

Windows NT versions prior to 4.0 do not support Adapter Teaming options.

Adapter Teaming options require NT 4.0 with Service Pack 4.0 or later (or Service Pack 3.0 and the Windows Hot Fix).

In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Adapter Fault Tolerance

Adapter Fault Tolerance (AFT) is a simple, effective, and fail-safe approach to increase the reliability of server connections. AFT gives you the ability to set up link recovery to the server adapter in case of a cable, port, or network interface card failure. By assigning two server adapters as a team, AFT enables you to maintain uninterrupted network performance.

AFT is implemented with two server adapters: a primary adapter and a backup, or secondary, adapter. During normal operation, the backup will have transmit disabled. If the link to the primary adapter fails, the link to the backup adapter automatically takes over.

Adaptive Load Balancing

Adaptive Load Balancing (ALB) is a simple and efficient way to increase your server's transmit throughput. With ALB you group server adapters in teams to provide an increased transmit rate (up to 8 Gbps) using a maximum of eight adapters. The ALB software continuously analyzes transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Receive rates remain at 100 Mbps or 1 Gbps depending on the primary adapter's capability.

To use ALB, you must have two to eight server adapters installed in your server and linked to the same network switch.

3 Hardware configuration

This chapter describes detailed procedures for system hardware setup.

Installation precautions

Before you install any system component, we recommend that you read the following sections. These sections contain important ESD precautions along with preinstallation and post-installation instructions.

ESD precautions

When installing or removing system components, perform such procedures only at an electrostatic discharge (ESD) workstation, because the server components can be extremely sensitive to ESD. If no such station is available, you can reduce the risk of ESD damage by doing the following:

- Do not remove a component from its protective packaging until you are ready to install it.
- Touch the metal on the server chassis before touching the server components.
- Wear a wrist grounding strap and attach it to a metal part of the server before handling components.
- If a wrist strap is not available, maintain contact with the metal chassis throughout any procedure requiring ESD protection to dissipate the static charge while handling the components.
- Avoid moving around unnecessarily.
- Hold the server components (especially boards) only by the edges.
- Place the server components on a grounded, static-free surface. Use a conductive foam pad if available but not the component wrapper.
- Do not slide the components over any surface.

Preinstallation instructions

Always observe the following before you install any component:

1. Turn off your system and all the peripherals connected to it.
2. Unplug all cables from the power outlets.
3. Open your system according to the instructions on page 44.
4. Follow the ESD precautions described in this chapter when handling a server component.
5. Remove any expansion board(s) or peripheral(s) that block access to the DIMM socket or other component connector.

Warning! Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

Post-installation instructions

Observe the following after installing a server component:

1. See to it that all components are installed according to the described step-by-step instructions.
2. Check to make sure you have not left loose tools or parts inside the system.
3. Reinstall any expansion board(s), peripheral(s), board cover(s) that you have previously removed.
4. Reinstall the chassis panels
5. Insert and lock the padlock to the system to prevent unauthorized access to the inside of the system.
6. Connect all external cables and the AC power cord(s) to the system.
7. Turn on the system.

Tools and supplies needed

You will need the following items in installing the system components:

- Phillips screwdriver
- Small flat-bladed screwdriver
- Extraction tool for processor heat sink clips
- Antistatic wrist strap and conductive foam pad (recommended)
- Pen or pencil
- Equipment log (for a sample sheet, refer to page 197)

  As you integrate new components into the system, record the model and serial number of the server system, all installed options, and any other pertinent information specific to the server system. You will need this information when running the SSU.

System access panels

This section discusses the procedures in:

- Removing and replacing the rear access panel
- Removing and replacing the front access panel

Before removing the access panels

To avoid personal injury or property damage, the following safety instructions apply whenever accessing inside the product:

1. Turn off all peripheral devices connected to this product.
2. Turn off the system by pressing the power button on the front of the product.
3. Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
4. Disconnect all cables and telecommunication lines that are connected to the system.
5. Retain all screws or other fasteners when removing the access panel(s). Upon completion of accessing inside the product, refasten access panels with original screws or fasteners.
6. Do not access inside power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.

Rear access panel

The rear access panel provides access to the electronics bay, which contains the PCI add-in cards and the server board set, and to the power supply bay.

To remove the rear access panel

1. Release the captive screws located on the rear edge of the panel.
2. While lightly pressing the panel against the chassis, slide it toward the rear of the chassis.

3 Lift the panel away from the chassis.

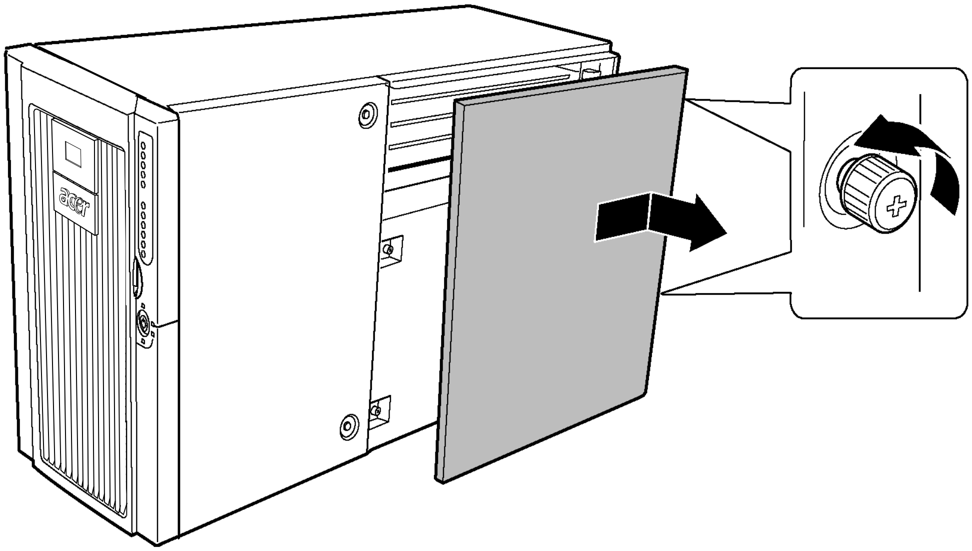


Figure 12 - Removing the rear access panel

To install the rear access panel

Note: Before installing the rear access panel, check that you have not left any tool or loose parts inside the system.

1 Position the panel on the chassis so that the panel tabs align with the chassis slots.

2 While lightly pressing the panel against the chassis, slide it toward the front of the chassis until the panel tabs fully engage the chassis slots.

3 Attach the panel to the chassis with the captive fasteners located on the rear edge of the panel.

Front access panel

The front access panel provides access to the hot-swap fans, to devices in the peripherals bay, and to the hot-swap drive bay.

To remove the front access panel

1. Remove the rear access panel (refer to page 44).
2. Release the two captive panel screws (Figure 13, A).
3. Lift the rear edge of the panel slightly and slide it toward the rear of the chassis.
4. Lift the panel up and off of the chassis.

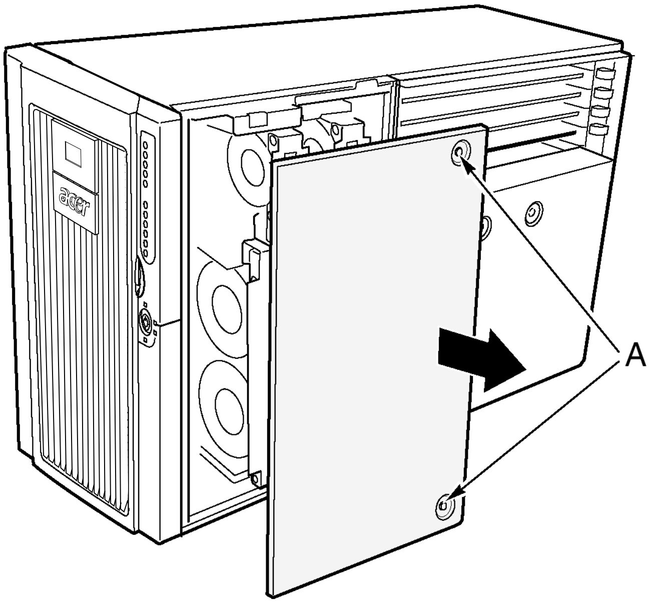


Figure 13 - Removing the front access panel

To install the front access panel

Note: Before installing the front access panel, check that you have not left tools or loose parts inside the system.

1. Position the panel on the chassis so that the panel tabs align with the chassis slots.
2. While lightly pressing the panel against the chassis, slide it toward the front of the chassis until the panel tabs fully engage the chassis slots.
3. Attach the panel to the chassis with the captive screws.
4. Reinstall the rear access panel (refer to page 45).

Front subchassis and rear electronics bay

The server chassis consists of three parts, which include the following:

- Main chassis
- Front subchassis (sometimes called the C-tilt)
- Rear electronics bay

Both the front subchassis and the rear electronics bay swing open. Additionally, you can completely remove them to gain access to the server's internal components. You can more easily open and remove the front subchassis and electronics bay if the system is laying on its side (rack-mount orientation).

Opening the front subchassis and rear electronics bay

The front subchassis must be opened slightly to allow the rear electronics bay to open because the front subchassis overlaps the rear electronics bay.

To open the front subchassis and rear electronics bay

1 Remove the front and rear access covers (refer to page 46 and page 44).

2 To open the front subchassis, grasp the edge of the bezel and swing the front subchassis out until the spring clip at the top of the subchassis just springs open.

3 To open the rear electronics bay:

  a Disconnect all cables attached to the mainboard.

  b Grasp the inside edge of the electronics bay and swing the electronics bay out from the main chassis.

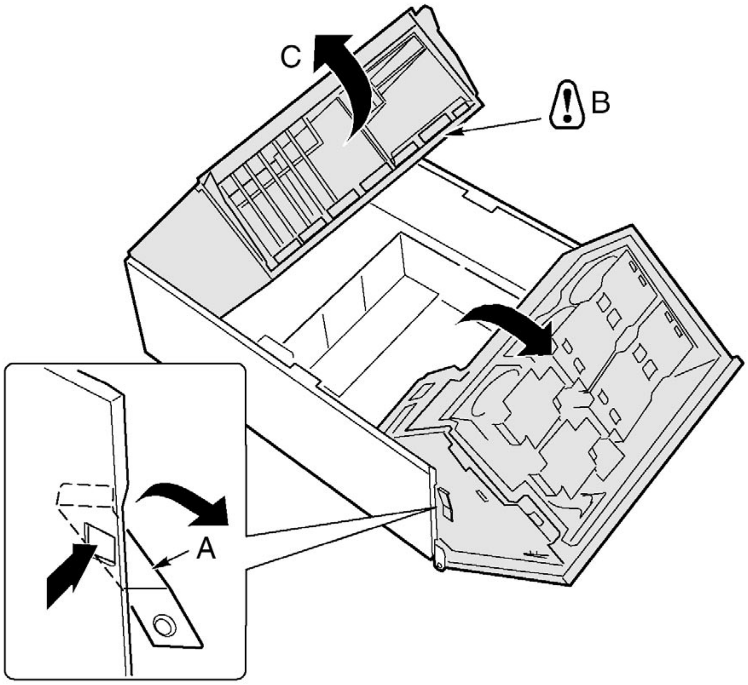


Figure 14 - Opening the front subchassis and rear electronics bay

Label	Description
A	Front subchassis latch
B	Mainboard cables
C	Rear electronics bay

Removing the front subchassis and rear electronics bay

To remove the front subchassis

1. Disconnect all cables attached to the power distribution board and to the mainboard.
2. With the front subchassis open, lift it straight up and clear of the main chassis.

To remove the electronics bay

With the electronics bay open, pull it up and toward the front of the chassis, lifting it clear.

Installing the front subchassis and rear electronics bay

To install the front subchassis

1 With the front subchassis tilted open about 30°, align the notch in the subchassis with the hinge pins on the main chassis.

2 Lower the subchassis straight down until the hinge pins engage the notches.

3 Connect all cables from the front subchassis to the power distribution board and to the mainboard.

To install the electronics bay

1 With the electronics bay tilted open about 30°, align the pins on the electronics bay with the notches in the main chassis .

2 Lower the electronics bay until the pins engage the notches and slide it back and down.

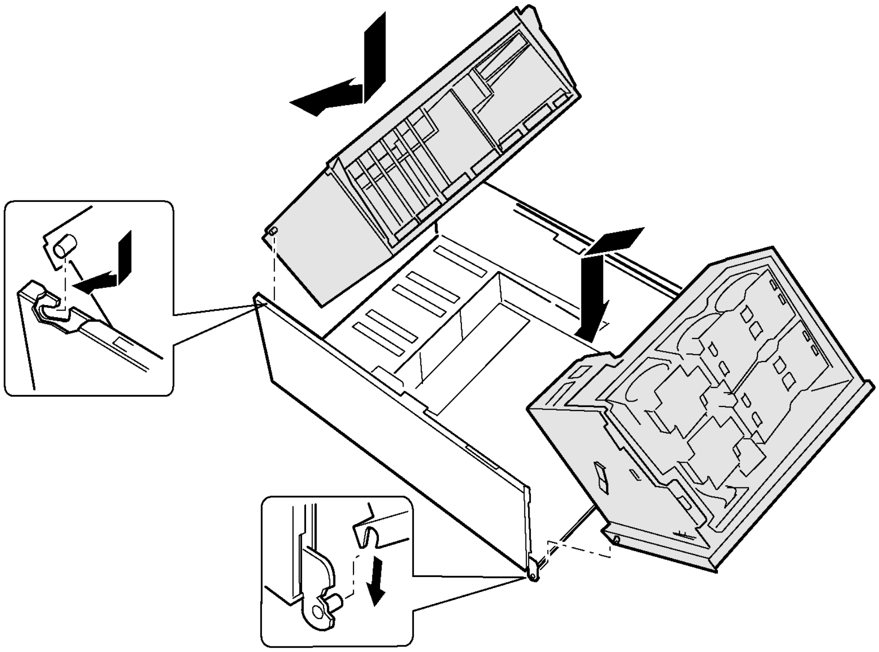


Figure 15 - Installing the front subchassis and rear electronics bay

Closing the front subchassis and rear electronics bay

Caution! Before you close the front subchassis or electronics bay, make sure no cables are pinched or otherwise obstructing the front subchassis and rear electronics bay. Excessive cable stress or chafing can cause cables to disconnect and connector pins to bend or break the cable insulation.

To close the front subchassis and rear electronics bay

1. To close the rear electronics bay:
   a. Grasp the inside edge of the electronics bay and swing the electronics bay into the main chassis.
   b. Connect all cables to the mainboard.
2. To close the front subchassis:
   a. Grasp the edge of the front subchassis.
   b. Depress and hold the spring clip (Figure 16, B) and swing the front subchassis all the way into the main chassis.

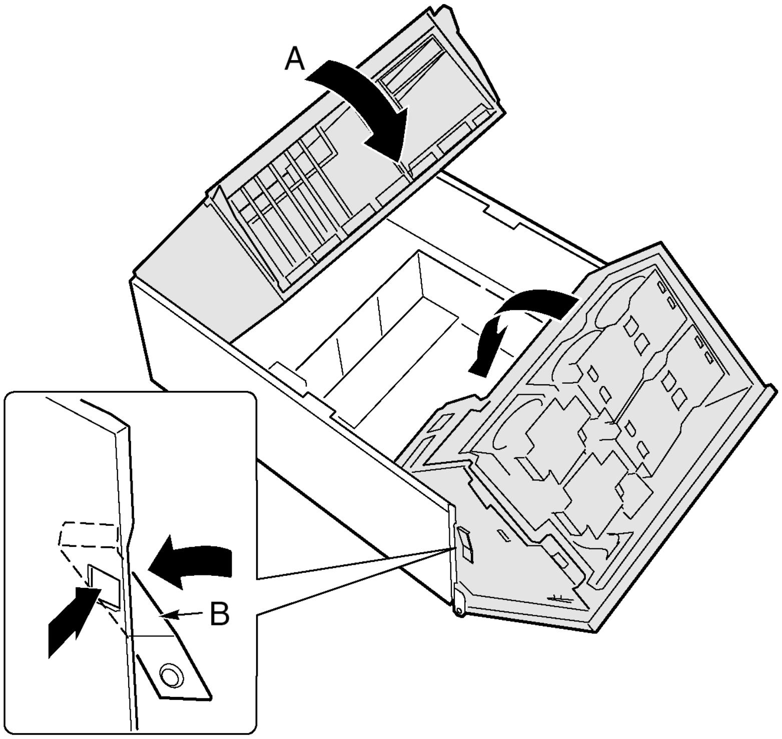


Figure 16 - Closing the front subchassis and rear electronics bay

Accessing the system boards

This section discusses the procedures in:

- Removing and installing the access cover to the system boards
- Removing and installing the memory board
- Removing and installing the processor board air baffle
- Removing and installing the processor board
- Removing and installing the mainboard

Caution! A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.

Access cover to the system boards

To remove the access cover to the system boards

1 Remove the rear access panel (refer to page 44).

2 Loosen the two captive screws located at the front of the access cover to the system boards.

3 Lift the end of the cover where the screws are located and remove the cover.

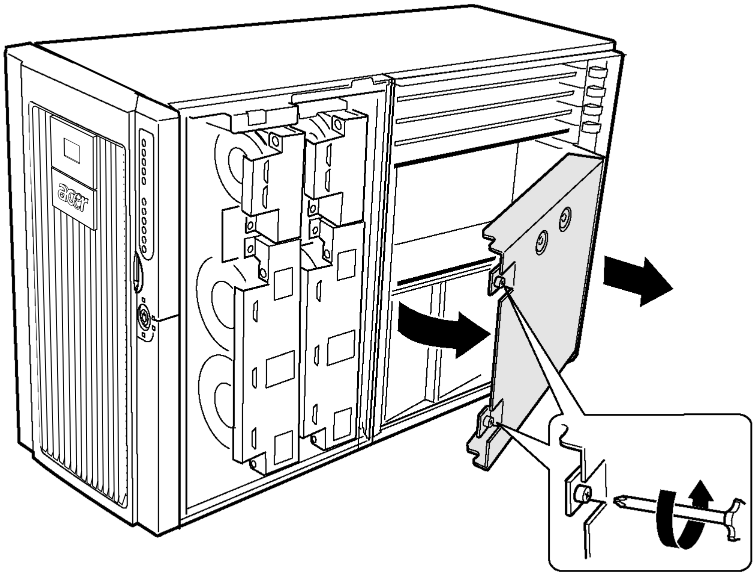


Figure 17 - Removing the access cover to the system boards

To install the access cover to the system boards

1. Orient the access cover with the captive screws toward the front of the server.
2. Insert the tabs on the rear of the cover into the slots at the rear of the chassis.
3. Press down gently and tighten the captive screws at the front of the cover.

Memory board

To remove the memory board

1. Grasp the bracket on the top edge of the memory board and pull straight up until the board disengages from the connector on the processor board.
2. Lift the memory board out of the chassis.

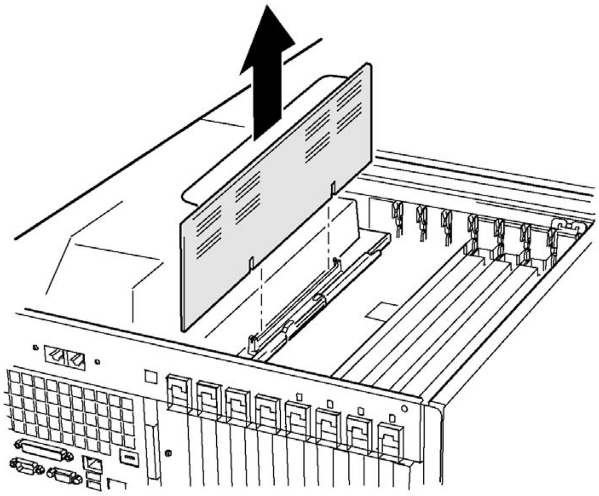


Figure 18 - Removing the memory board

To install the memory board

1. Holding the bracket on the top edge of the memory board, insert the board into the guides at both ends of the electronics bay.
2. Align the memory board with the connector on the processor board and press down on the bracket until the board is fully inserted into the connector.

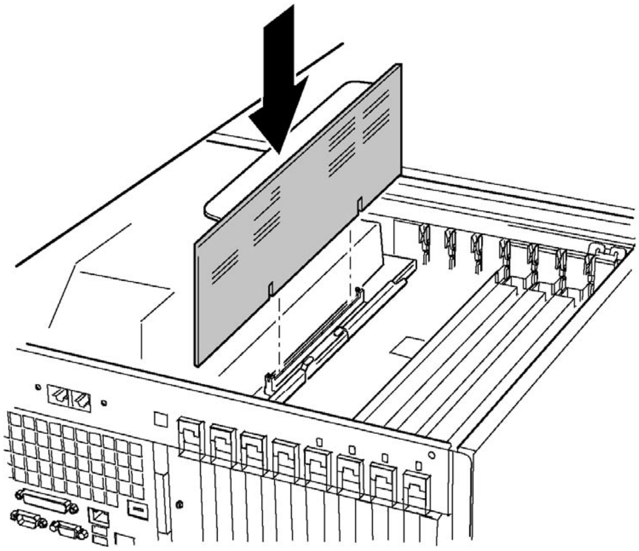


Figure 19 - Installing the memory board

Processor board air baffle

To remove the processor board air baffle

1 At the end of the air baffle closest to the rear of the chassis, press the two tabs toward each other (Figure 20, A) and raise the end, rotating the baffle about 30°.

2 Disengage the air baffle at the front of the electronics bay and remove the baffle from the chassis.

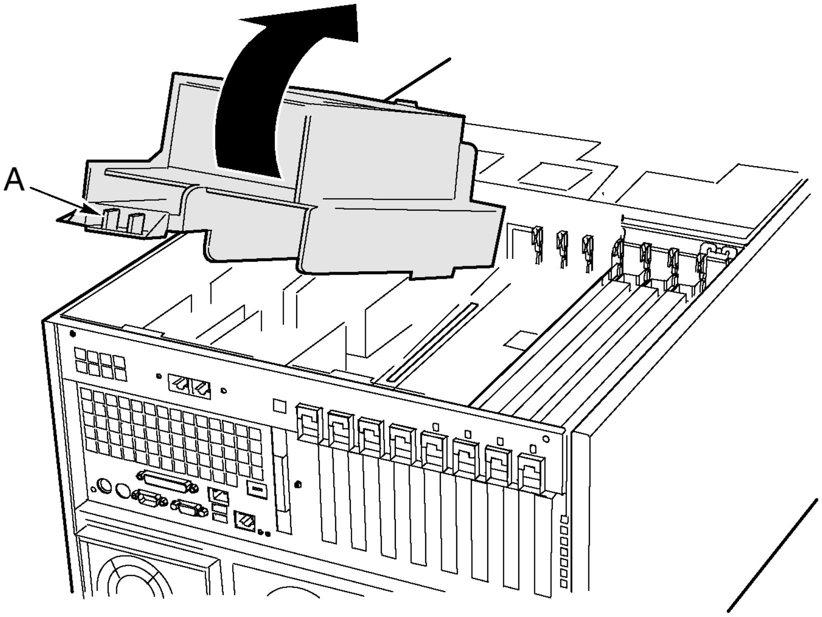


Figure 20 - Removing the processor board air baffle

To install the processor board air baffle

1 Orient the baffle so that the two release tabs are toward the rear of the chassis.

2 With the rear of the air baffle raised, insert the tab on the front of the air baffle into the slot in the chassis.

Holding the baffle at an angle of about 30° will allow the tab to engage correctly.

3 Rotate the rear end of the baffle down. Adjust the position of the baffle until it moves into place and the two tabs are engaged. Do not force it down.

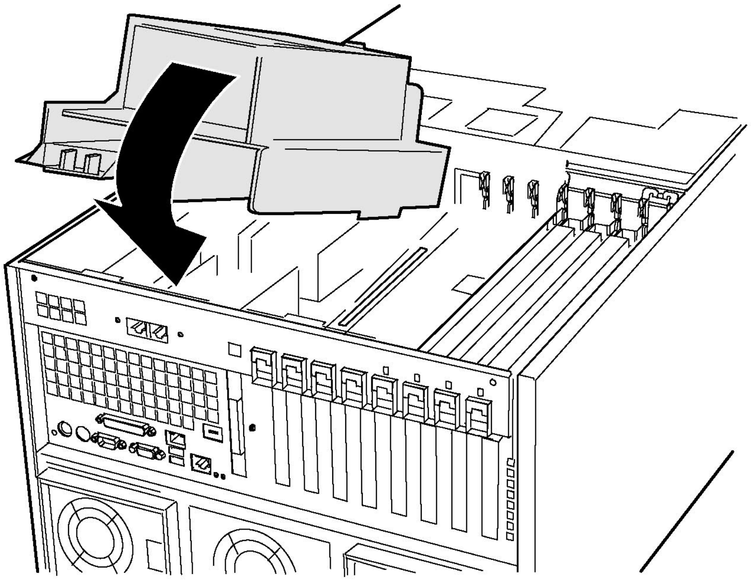


Figure 21 - Installing the processor board air baffle

Processor board

To remove the processor board

1. Rotate the handles on the processor board until they are fully open.
2. Using the handles, tilt the processor board up and remove it from the chassis.

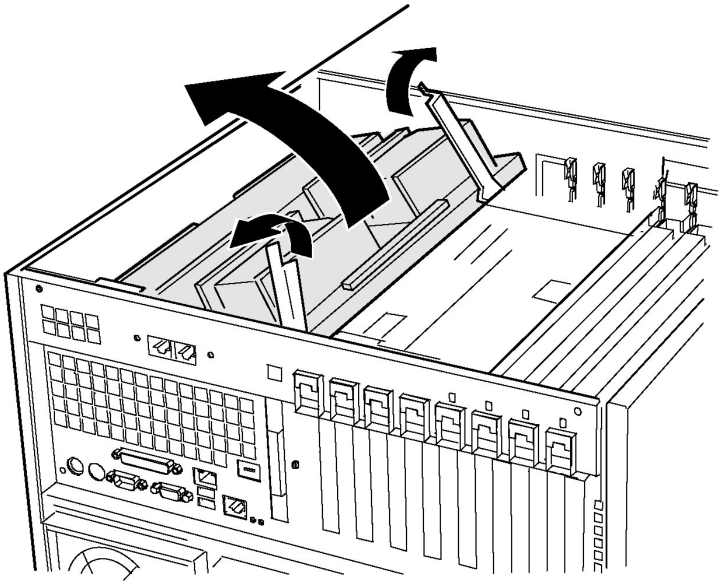


Figure 22 - Removing the processor board

To install the processor board

1 Insert the tabs on the processor board into the slots on the mainboard bracket (Figure 23, A).

2 With the handles in the open position, lower the processor board until it rests on the mainboard bracket.

3 Close and press down on the handles until the processor board is fully engaged with the sockets on the mainboard.

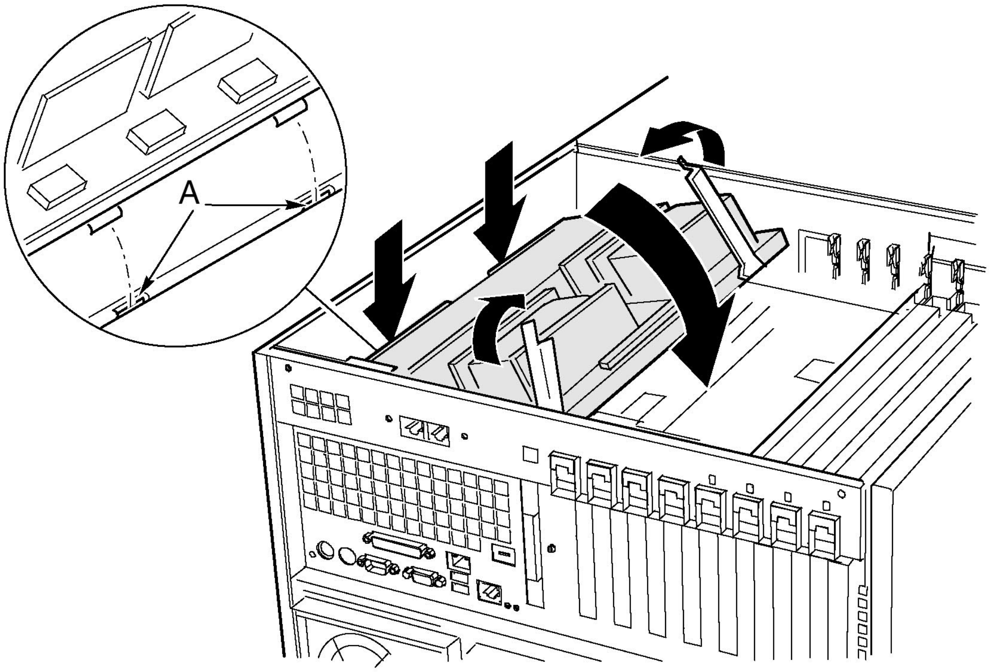


Figure 23 - Installing the processor board

Mainboard

To remove the mainboard

1. Remove all external cables from the mainboard I/O ports at the back of the chassis.
2. Label and disconnect all internal cables connected to the PCI add-in boards.
3. Remove all PCI add-in boards (refer to page 73 and 76).
4. Plastic curtains run the length of the electronics bay separating the PCI add-in cards. Remove the curtains as follows:
   - a Release one end of the curtain from the front retention mechanism. Lift the free end high enough to clear the chassis.
   - b From outside of the rear of the chassis, push down on the other end of the curtain and pull the free end out of the chassis.
5. Label and remove all internal cables attached to connectors on the board.

For a diagram showing labeled connectors, refer to “Mainboard layout” on page 13.

6 Remove all cables from the cable retention clip on the front of the electronics bay.

7 A plastic retention mechanism for the PCI add-in cards is fastened to the front of the electronics bay by three clips (Figure 24, A). Release each clip by pressing down on the tab and remove the retention mechanism.

8 Remove the plastic protective overlay covering the PCI area of the mainboard as follows:

  a Unscrew the captive screw holding the overlay in place (Figure 24, D).

  b Near the middle of the mainboard, lift the edge of the overlay until it is clear of the connectors on the board (Figure 24, B).

  c Slide the overlay toward the front of the electronics bay and unhook it from the two tabs (Figure 24, C).

  d Remove the overlay.

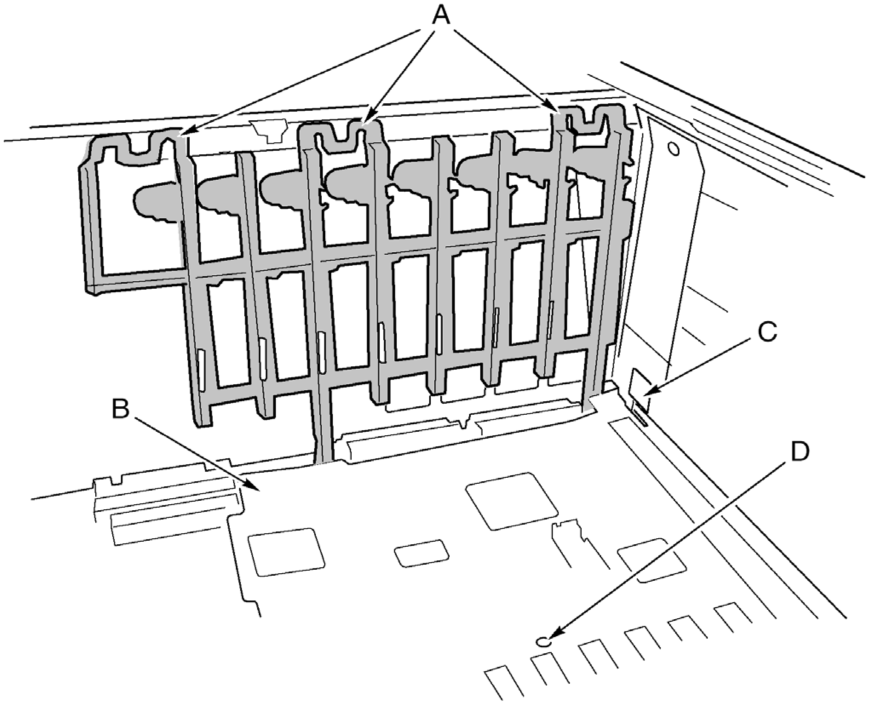


Figure 24 - Removing the front retention mechanism

Label	Description	Label	Description
A	Tabs (3) on retention mechanism	C	Overlay tab (1 of 2)
B	Protective overlay	D	Overlay screw

9 Remove the six screws, the plastic overlay, and the two processor board mounting brackets that attach the mainboard to the electronics bay (Figure 25, A).

10 Lifting the board slightly, slide the mainboard toward the front of the chassis until the I/O ports clear the chassis.

11 At one side of the chassis, the board is inserted into slots in a foam panel (Figure 25, B). Lift up on the opposite end of the board and pull the edge of the board out of the slots in the foam panel.

12 Lift the mainboard out of the electronics bay and place it component-side up on a nonconductive, static-free surface (or in an antistatic bag).

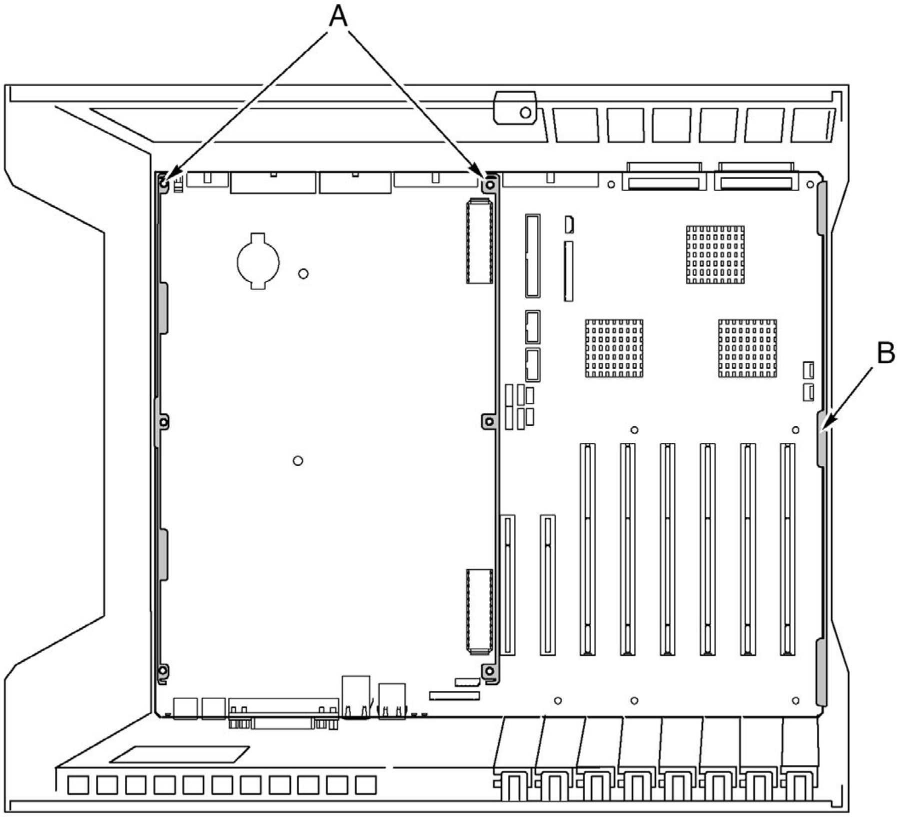


Figure 25 - Mainboard mounting

To install the mainboard

1 With the rear of the electronics bay closest to you and the mainboard oriented so that the I/O connectors line up with the cutout in the back left of the chassis (Figure 25), lower the right end of the mainboard into the electronics bay and slip the board edge into the slots of the foam panel (Figure 25, B).

2 Lower the other end of the mainboard to the floor of the electronics bay and slide it toward the back of the chassis until:

  a The I/O connectors fit all of the way into the I/O connector openings.

  b The six mounting holes on the mainboard (Figure 25, B) are aligned with their corresponding threaded standoffs in the floor of the electronics bay.

3 Install the processor board mounting brackets and processor-side plastic overlay as follows:

  a Align the processor board mounting bracket for the center of the mainboard with the three mounting holes. Insert a screw through each of the holes and partially thread the screws into the standoffs.

  b Align the other mounting bracket along the edge of the board. Align the plastic overlay with the bracket and the two plastic studs. Insert a screw through each of the holes in the overlay and mounting bracket and partially thread the screws into the standoffs.

  c Adjust the board position as needed and tighten the six screws.

4 Install the plastic protective overlay covering the PCI area of the board as follows:

  a At the side of the electronics bay where the edge of the mainboard is inserted into the foam, place the two slots in the overlay over the hooked tabs (Figure 24, C on page 58).

  b Slide the overlay toward the rear of the chassis to hook the tabs in the slots.

  c Carefully fit the overlay around the mainboard connectors and down against the board.

  d Tighten the captive screw that holds the overlay in place.

5 Install the front retention mechanism for the PCI add-in cards on the front wall of the electronics bay (Figure 24 on page 58).

6 Connect all internal cables to the mainboard.

   To make sure you route the cables correctly, refer to “Front panel board” on page 91. If the cables are not routed correctly, you won't be able to close the front subchassis.

7 Install the PCI add-in board curtains as follows:

   a At the back of the electronics bay, slide the end of a curtain with the locking tab into the topmost square hole adjacent to any add-in board expansion slot.

   b At the front of the electronics bay, slide the tab at the other end of the curtain into the clip on the corresponding retention mechanism.

8 Install all PCI add-in boards and attach any internal cables to the boards.

9 Attach the external cables to the mainboard I/O ports.

Memory

This section includes instructions for removing and installing DIMMs on the memory board.

DIMM sequence

Load the DIMMs in the following order:

- Bank 1: DIMMs #1, 2, 3, and 4
- Bank 2: DIMMs #5, 6, 7, and 8
- Bank 3: DIMMs #9, 10, 11, and 12

Always fill banks completely. Partially filled banks are ignored by the system.

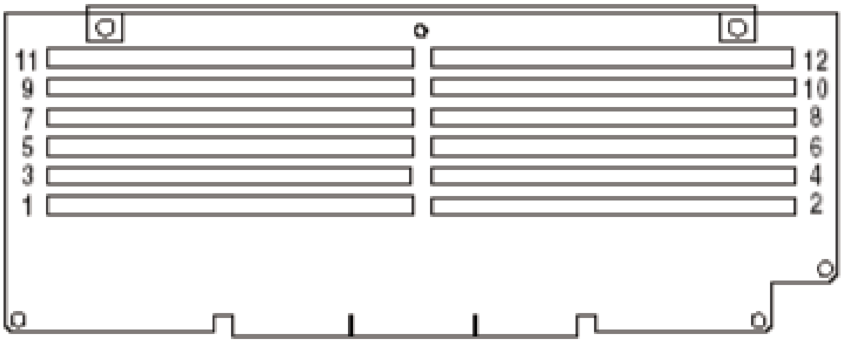


Figure 26 - Correct order in loading DIMMs

To install DIMMs

Caution! Use extreme care when installing a DIMM. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

1. Remove the memory board (refer to page 52), and place the board component-side up on a nonconductive, static-free surface.
2. Holding the DIMM only by its edges, remove it from its antistatic package.
3. Open the plastic ejector levers (Figure 27, A) at each end of the DIMM socket on the memory board .

4 Orient the DIMM so that the notch in the bottom edge of the DIMM aligns with the keyed socket on the memory board.

5 Insert the bottom edge of the DIMM into the socket and press down firmly on the DIMM until it seats correctly. The plastic ejector levers should snap into place when the DIMM is seated.

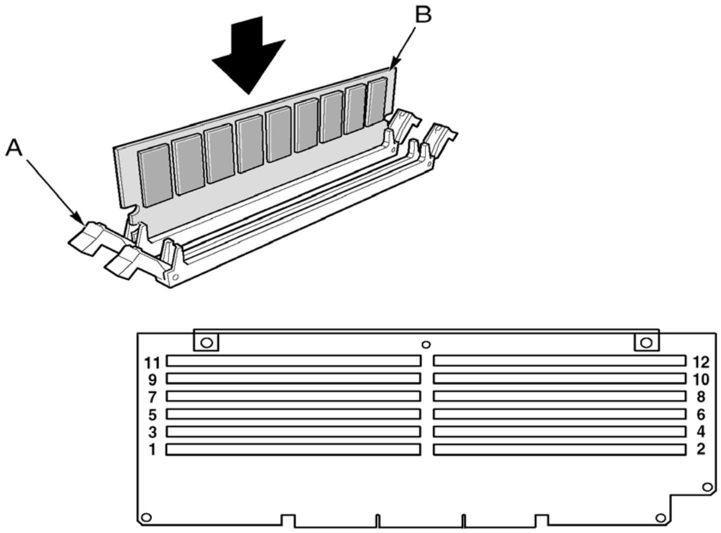


Figure 27 - Installing a DIMM

6 Make sure that the plastic ejector levers on the socket ends are fully closed.

7 Reinstall the memory board (refer to page 53).

To remove DIMMs

1 Remove the memory board (refer to page 52). Place the board component-side up on a nonconductive, static-free surface.

2 Locate the DIMM you want to remove and gently push down on the plastic ejector levers (Figure 28, A) to eject the DIMM from its socket.

3 Hold the DIMM only by its edges, being careful not to touch its components or gold edge connectors. Carefully lift it away from the socket and store it in an antistatic package.

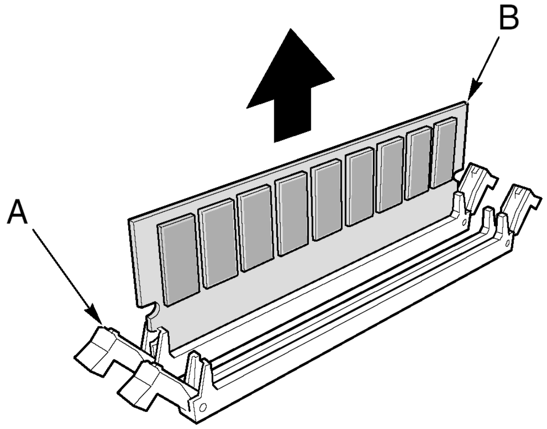


Figure 28 - Removing a DIMM

Processors

This section includes instructions for installing and removing processors and heat sinks.

Processor sequence

You must install a processor in processor socket 1. When installing multiple processors, populate the processor sockets in the order shown in the figure below.

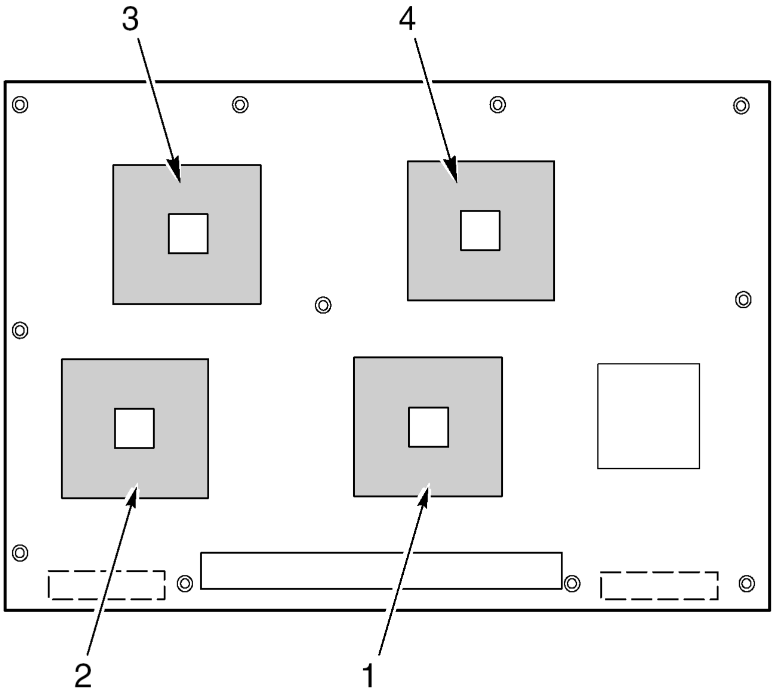


Figure 29 - Correct order in loading processors

Important: If you are not using processor sockets 3 and 4, leave the foam block in place. The block is required for proper airflow for cooling the processors.

To install processors

1 Raise the locking bar on the socket.

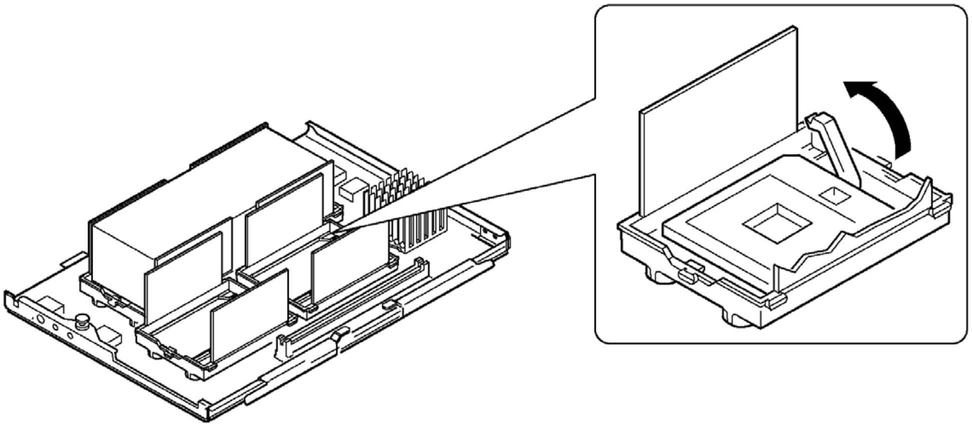


Figure 30 - Raising the locking bar

2 Orient the processor so that the triangle on the corner of the processor aligns with the triangle on the corner of the socket.

3 Aligning the pins of the processor with the socket, insert the processor into the socket. The processor should drop into the socket without requiring any force.

4 Lower the locking bar completely.

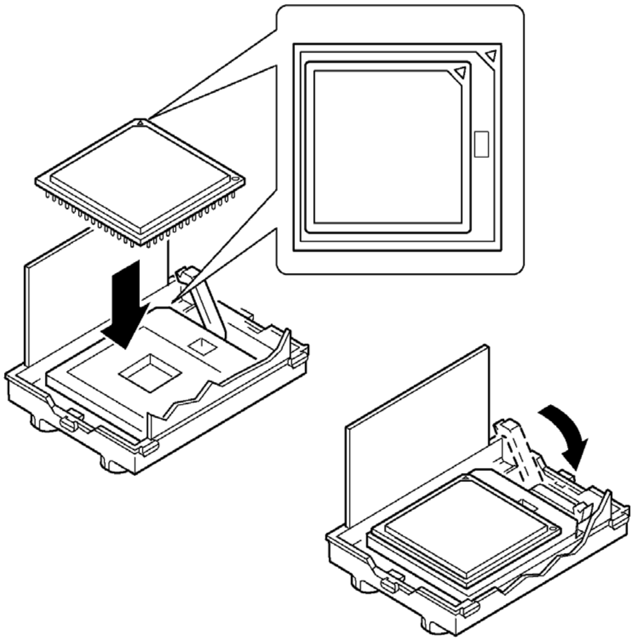


Figure 31 - Installing a processor

5 Following the instructions packaged with the applicator, apply thermal grease to the processor.

6 Insert the heat sink (Figure 32, A) into the air baffle and place it on top of the processor.

7 Install both heat sink retention clips (Figure 32, D) as follows:

   a Place the heat sink clip on the center tab of the retention module and slide the clip to the right to engage the center tab.

   b Snap one end of the clip down over the corresponding tab on the retention module (Figure 32, C).

   c Snap the remaining end of the clip down over the corresponding tab.

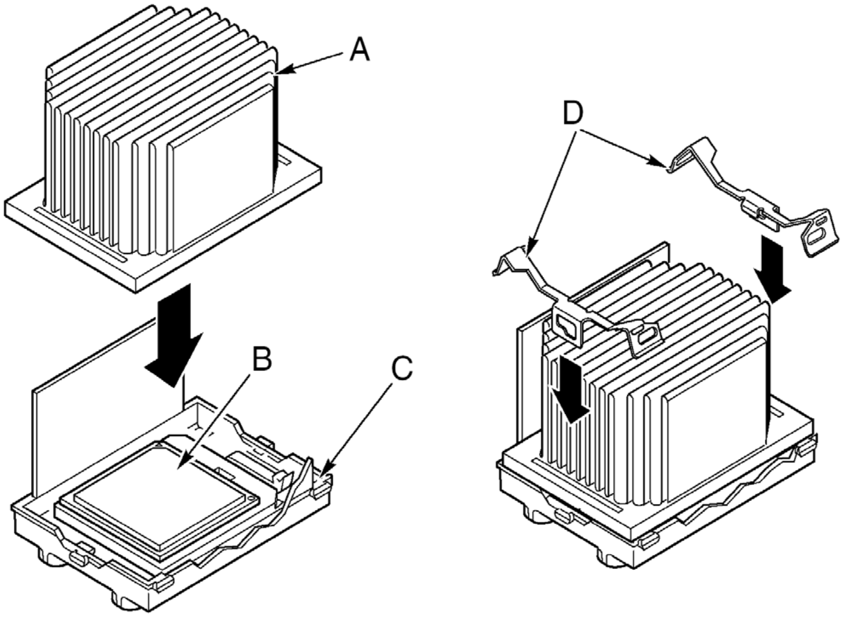


Figure 32 - Installing the heatsink

To remove processors

Caution! A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.

1 Remove both heat sink clips as follows:

   a Insert the heat sink clip extraction tool (refer to page 43) into the slot at one end of the clip.

   b Press down on the tool until the clip clears the bottom edge of the tab on the retention module and rotate the tool until the end of the clip is free of the tab.

   c Using the clip extraction tool, release the other end of the clip.

   d Slide the clip to the left to disengage it from the center tab on the retention module and remove the clip.

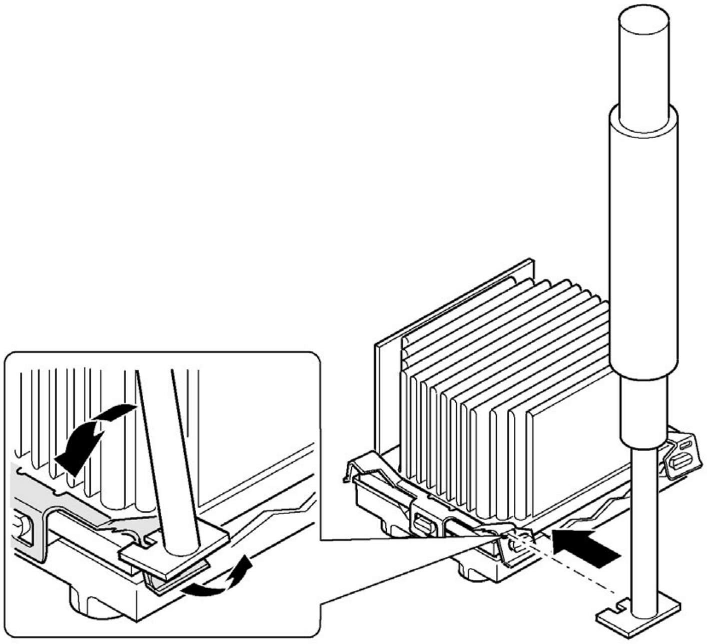


Figure 33 - Removing the heatsink clips

2 Lift the heat sink straight out of the retention module.

3 Raise the locking bar on the socket.

4 Remove the processor from the socket.

PCI add-in boards

PCI add-in board locations

The Altos G900 server supports four hot-plug PCI add-in boards and four non-hot-plug PCI add-in boards.

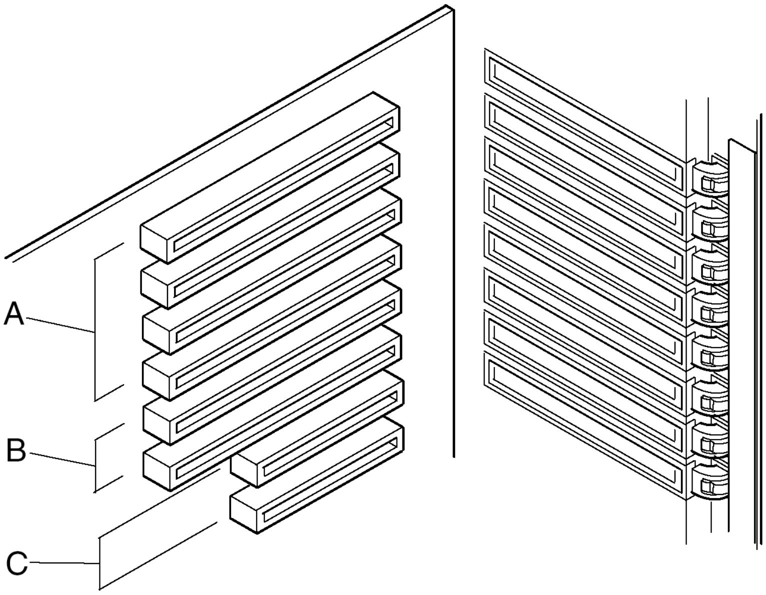


Figure 34 - PCI add-in board locations

Label	Description
A	Four hot-plug 64-Bit, 66-MHz PCI-X add-in board slots
B	Two non-hot-plug 64-Bit, 100-MHz PCI-X add-in board slots
C	Two non-hot-plug 32-Bit, 33-MHz PCI add-in board slots

Caution! Be sure any empty expansion slots have a slot cover installed. An open expansion slot reduces the cooling and EMI integrity of the server and can affect performance and cause damage due to overheating.

Operating system support for hot-plug add-in boards

Some operating systems support hot-plugging PCI add-in boards and some do not. Operating system support is provided by a driver that you must install when setting up your server. Hot-plug drivers are available on the Drivers directory of the System CD. The driver files on the CD include information on installing and using the hot-plug software.

Without a driver, the operating system does not support hot-plug installation and removal of PCI add-in boards. In that case, you must treat all eight PCI slots as non-hot-plug slots and follow the instructions on page 74 for installing and removing all PCI add-in boards.

Checking the status indicators for a hot-plug add-in board

A bank of LED indicators on the back panel of the electronics bay indicates the status of the hot-plug PCI add-in boards.

The table below lists the LED states and the hot-plug PCI status indicated by each state.

Power LED state	Status
Green	Power to slot
Amber	Fault on slot
Not lit	No power to slot

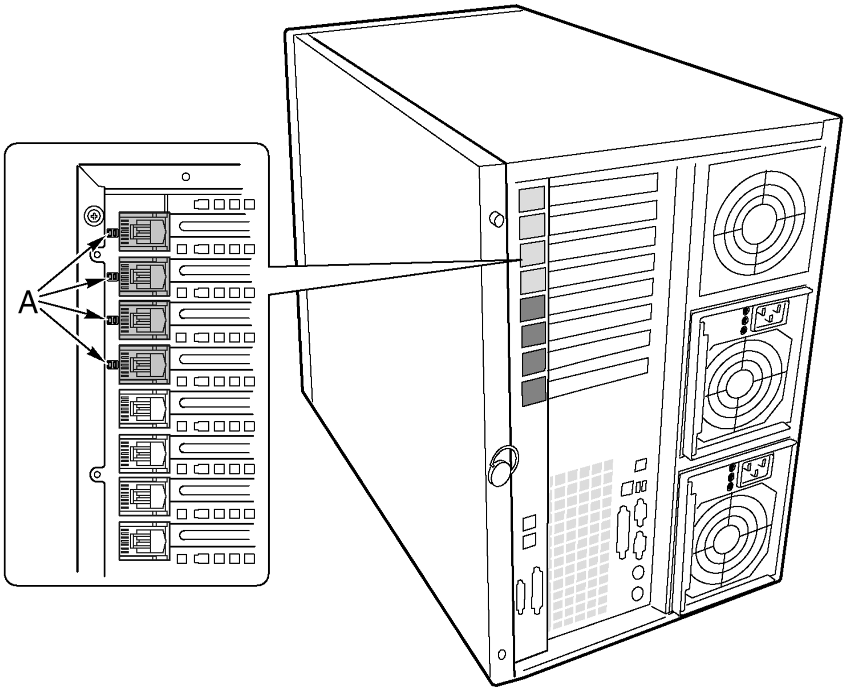


Figure 35 - Hot-plug PCI add-in board status indicators

Installing and removing a hot-plug PCI add-in board

To install a hot-plug PCI add-in board

1 Remove the rear access panel (refer to page 44).

2 If the LED for the slot indicates that power to the slot is on, turn it off by using the PCI hot-plug application software on your system.

The LED adjacent to the slot should now be off.

For more information, refer to "Operating system support for hot-plug add-in boards" on page 70.

3 Open the latches on the front and rear retention mechanisms (Figure 36, A and B).

4 If necessary, remove and save the expansion slot cover.

5 Prepare the new PCI board for installation:

   a Remove the add-in board from its protective wrapper. Be careful not to touch the components or gold edge connectors. Place the add-in board with the component side up on an antistatic surface.

   b Record the serial number of the add-in board in your equipment log.

   For a sample equipment log sheet, refer to page 197.

   c Set jumpers or switches according to the manufacturer's instructions.

6 On the edge opposite the connectors, grasp the board by both corners. Orient the board to the vacant hot-plug slot so that the metal retention bracket is toward the rear of the chassis.

7 Insert the board into the front and rear retention mechanisms. Carefully push down on the board until it engages and fully seats in the slot connector.

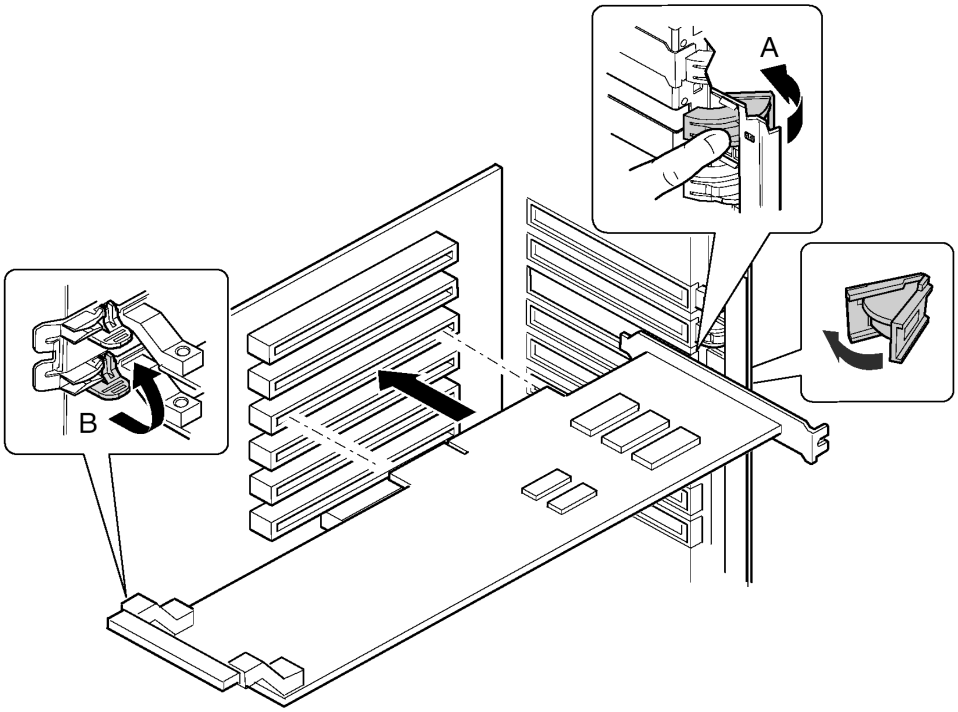


Figure 36 - Installing a hot-plug PCI add-in board

8 Close the front and rear latches.

9 Reinstall the rear access panel (refer to page 45).

10 Turn on power to the add-in board using the PCI hot-plug application software on your system.

To remove a hot-plug PCI add-in board

1 Remove the rear access panel (refer to page 44).

2 If the LED for the slot indicates that power to the slot is on, turn it off by using the PCI hot-plug application software on your system.

The LED adjacent to the slot should now be off.

For more information, refer to “Operating system support for hot-plug add-in boards” on page 70.

3 Disconnect any cables attached to the board you are removing.

4 Release the latches on the front and rear retention mechanisms (Figure 37, A and B).

5 Grasp the board at both corners, pull it out of the slot connector, and carefully slide it out of the retention mechanisms. Store the board in an antistatic protective wrapper.

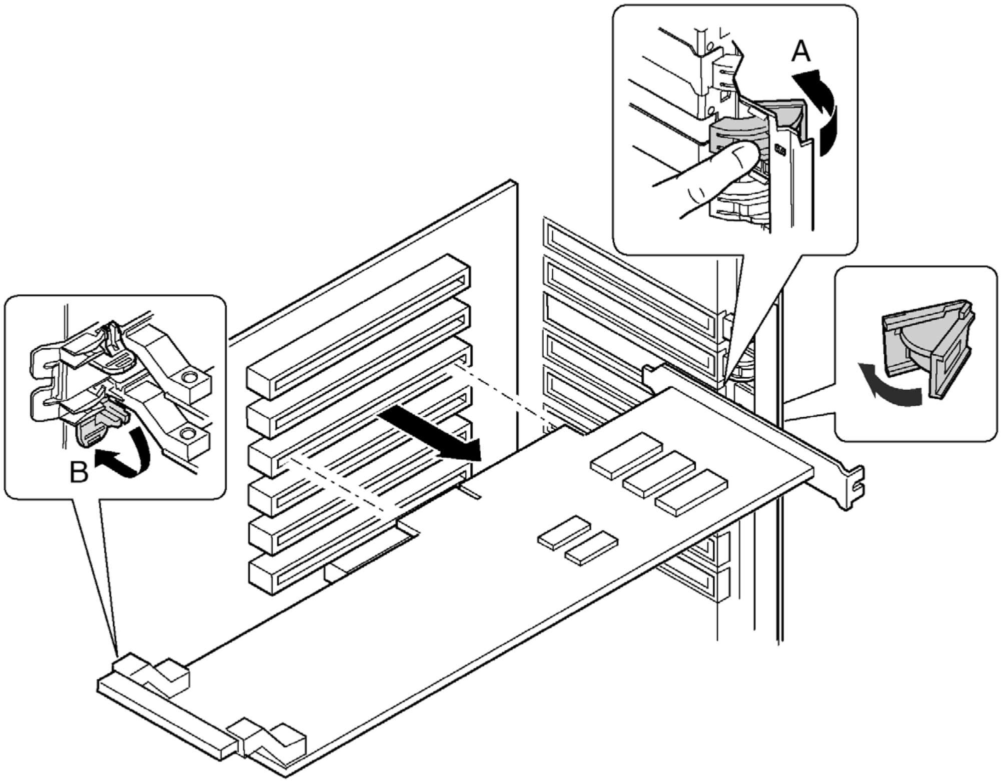


Figure 37 - Removing a hot-plug PCI add-in board

6 If you are not reinstalling a board in the same slot, install an expansion slot cover and reinstall the rear access panel (refer to page 45).

If you are installing a new board, follow the instructions on page 71.

Installing and removing a PCI add-in board in a non-hot-plug slot

Caution! The PCI add-in board slots located under the system board access panel are not hot-plug slots.

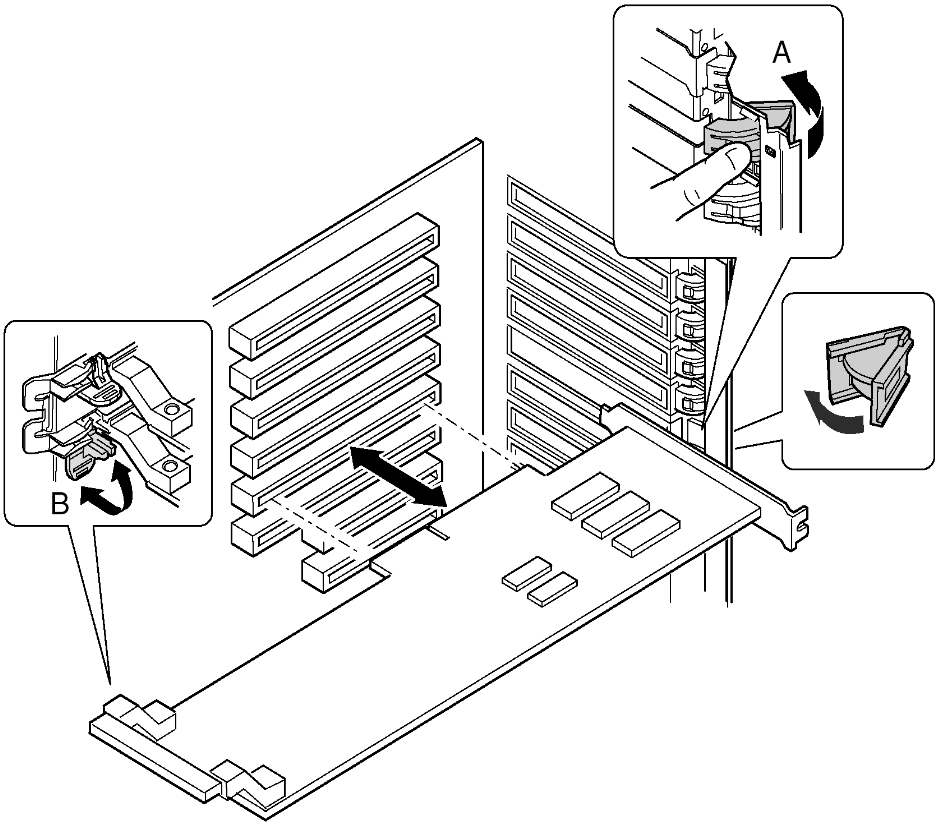


Figure 38 - Installing and removing a non-hot-plug PCI add-in board

To install a PCI add-in board in a non-hot-plug slot

1. Disconnect the AC power cords from the power source or wall outlets.
2. Turn off all peripheral devices connected to the server system.
3. Remove the rear access panel (refer to page 44) and the system board access panel (refer to page 51).
4. If necessary, remove and save the expansion slot cover.
5. Prepare the new PCI board for installation:
   - a Remove the add-in board from its protective wrapper. Be careful to not touch the components or gold edge connectors. Place the board with the component side up on an antistatic surface.
   - b Record the serial number of the new add-in board in your equipment log.

     For a sample equipment log sheet, refer to page 197.
   - c Set jumpers or switches according to the manufacturer instructions.
6. Open the latches on the front and rear retention mechanisms (Figure 38, A and B).
7. On the edge opposite the connectors, grasp the board by both corners. Orient the board to the vacant slot so that the metal retention bracket is toward the rear of the chassis.
8. Insert the board into the front and rear retention mechanisms. Carefully push down on the board until it engages and fully seats in the slot connector.
9. Close the front and rear latches.
10. Reinstall the system board access panel and the rear access panel.

    For instructions, refer to page 52 and page 45 respectively.
11. Turn on any peripheral devices connected to the system.
12. Connect the power cord and turn on power to the server.

To remove a PCI add-in board from a non-hot-plug slot

1 Disconnect the AC power cords from the power source or wall outlets.

2 Turn off all peripheral devices connected to the server system.

3 Remove the rear access panel (refer to page 44) and the system board access panel (refer to page 51).

4 Release the latches on the front and rear retention mechanisms.

5 Grasp the board by the top edge or corners, carefully pull it out of the connector, and slide it free of the retention bracket.

6 If you are installing a new board, follow the instructions on page 75.

If you are not installing another PCI add-in board, continue with the next step below.

7 Install a slot cover over the vacant slot in the back panel.

8 Install the system board access panel and the rear access panel.

For instructions, refer to page 52 and page 45 respectively.

9 Turn on any peripheral devices connected to the system.

10 Connect the power cord and turn on power to the server.

Hot-swap SCSI drives

Hot-swap drives are installed in carriers that fit into the hot-swap drive bay. This section describes the LED status indicators for the drive bays and gives instructions for using the drive carriers to install and remove drives.

Checking a hot-swap SCSI drive status indicator

Each hot-swap SCSI drive slot has a LED that indicates drive status. To view the LEDs, open the front access door of the bezel.

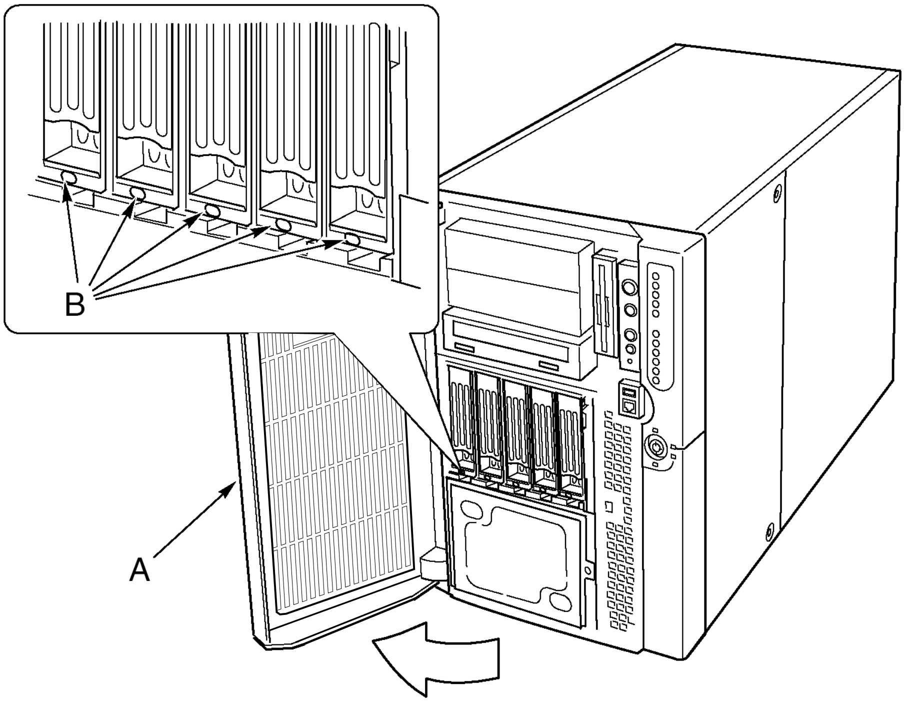


Figure 39 - Hot-swap SCSI drive bay and status indicators

Label	Description	Label	Description
A	Front access door	B	LED status indicators

The table below lists the LED states and the drive status indicated by each state.

LED state	Status
Solid green	The hard drive is present and powered on.
Flashing green	The hard drive is active.
Solid yellow	There is an asserted fault status on the hard drive.
Flashing yellow	A rebuild of the hard drive is in progress.
Off	The hard drive is not powered on.

Installing and removing a hot-swap drive in a carrier

To install a hot-swap drive in a carrier

Before you can install a drive in the hot-swap drive bay, you must install the drive into a drive carrier. To install a hot-swap drive in a carrier:

1 If the plastic air baffle is installed in the carrier, remove the four screws that attach the air baffle to the carrier.

Save the air baffle in case you later remove a drive.

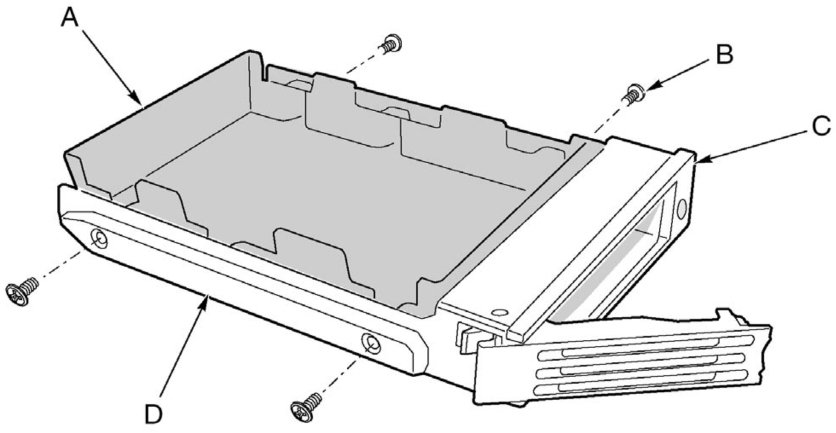


Figure 40 - Removing a plastic air baffle from a carrier

Label	Description	Label	Description
A	Air Baffle	C	Plastic rail
B	Screw	D	Plastic rail

2 Remove the hard drive from its wrapper and place it on an antistatic surface.

3 Record the new drive model and serial number in your equipment log.

For a sample equipment log sheet, refer to page 197.

4 Place the drive in the carrier with the component side down.

5 Using the four screws removed earlier, attach the drive to the carrier.

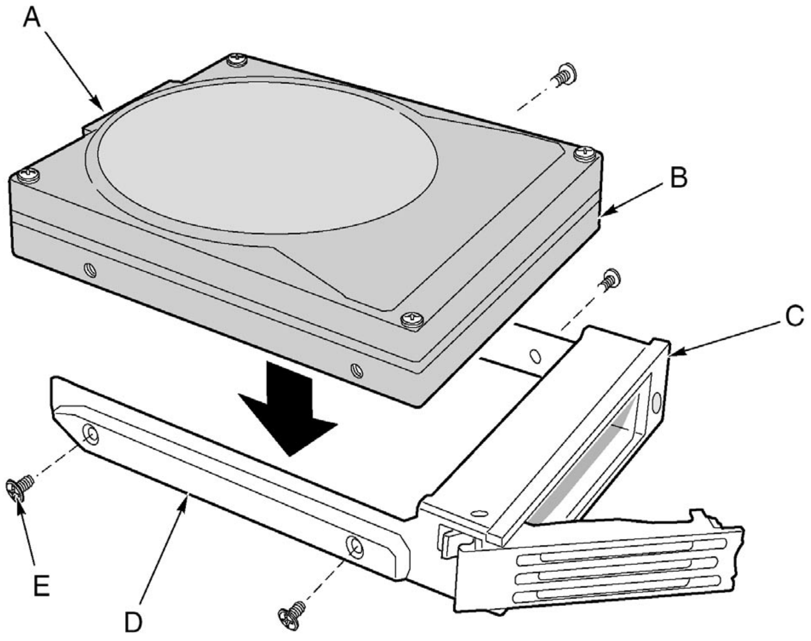


Figure 41 - Installing a SCSI hard disk drive in a carrier

Label	Description
A	SCA connector
B	Drive
C	Carrier
D	Plastic rail
E	Screw

To remove a hot-swap drive from a carrier

1. Remove the carrier and drive from the drive bay.
2. Remove the four screws that secure the drive to the carrier.
3. Place the drive on an antistatic surface.
4. If you are going to reinstall the carrier without a drive, you must first reinstall the air baffle in the carrier.

Removing and installing hot-swap disk drives

Important: Do not leave any drive slots without a drive or air baffle installed in the carrier. An empty carrier installed in a drive slot reduces cooling efficiency and can affect performance or cause damage due to overheating.

To install a hot-swap disk drive

1. Depress the green clip at the end of the plastic carrier handle.
2. Pull the handle out to disengage the carrier handle latch from the locking slot at the top of the drive bay.

3 Carefully pull on the carrier handle and slide the carrier out of the bay.

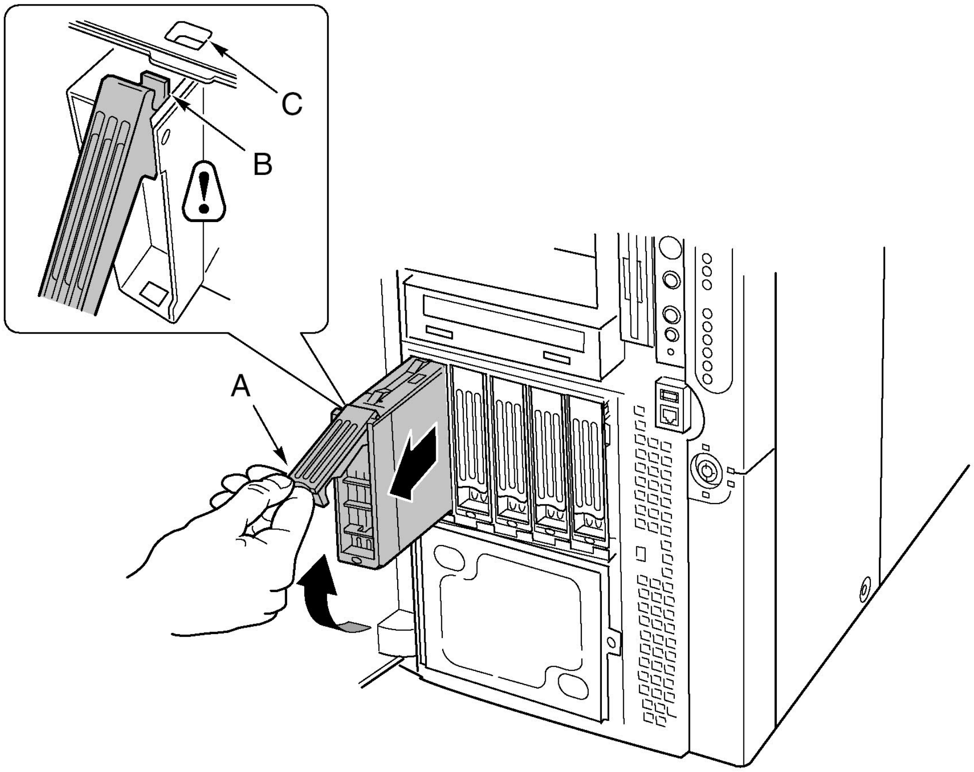


Figure 42 - Removing a drive carrier

Label	Description
A	Handle
B	Latch
C	Locking slot

4 Install a new drive into the carrier (refer to page 78).

5 Hold the carrier handle in the fully open position and slide the carrier into the desired bay.

6 Push the carrier into the drive bay until the carrier handle latch engages the locking slot in the edge of the drive bay.

7 Push the handle closed until it clicks into position.

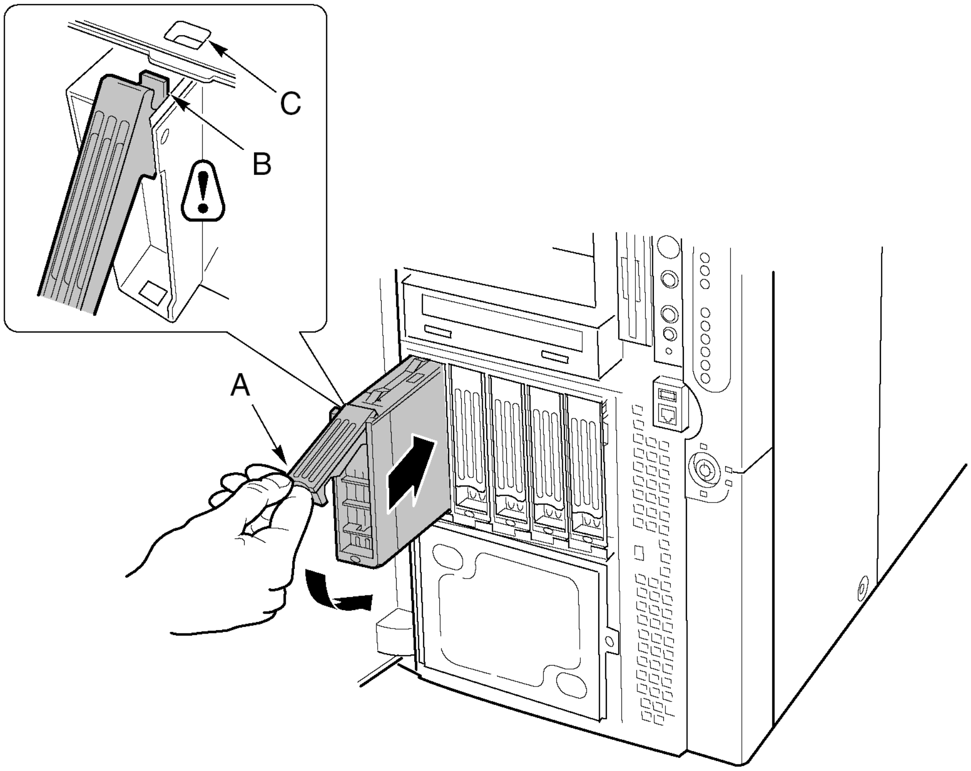


Figure 43 - Installing a drive carrier

DC power supplies

The power supply bay accommodates up to three power supply modules. The bay contains a power distribution board (PDB) that manages the delivery of power from the power supply modules.

Checking the power supply LED status indicators

The figure below shows the three power supply LED status indicators.

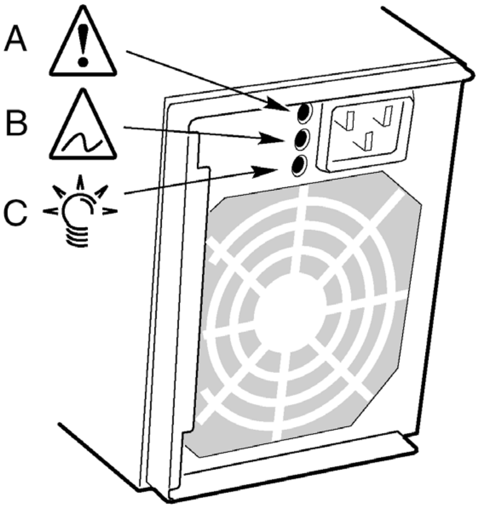


Figure 44 - Power supply LED status indicators

Label	**Description**
A	Power LED
B	Fail LED
C	Predictive Fail LED

Refer to the table below for a list of LED states and the power supply status indicated by each state.

Power (Green)	**Predictive fail (Amber)**	**Fail (Amber)**	**Status**
Off	Off	Off	No power to all power supplies.
Off	Off	On	Power supply failure or no power to this power supply.
Blinking	Off	Off	AC power present, standby outputs on.
On	Off	Off	Power supply on, DC outputs normal.
On	Off	Blinking	Current limit.
On	On or Blinking	Off	Imminent failure predicted; fan performance problem.

Note: If all power supply modules are functioning and all power cables from the power distribution board are properly connected to the mainboard and other components, but the server won't power on, replace the power distribution board (refer to page 105).

Removing and installing a power supply module

To remove a power supply module

1 Disconnect the AC power cord for the supply from the wall outlet or power source.

2 Remove the four screws that secure the power supply.

3 Pull the latch handle to release the power supply module and carefully pull the module out of the power supply bay.

Caution! To avoid damaging the module, do not tilt or twist the power supply module as you pull it from the power supply bay. The module disengaging from its connector causes the initial resistance you will feel. Use even, steady force to remove the module.

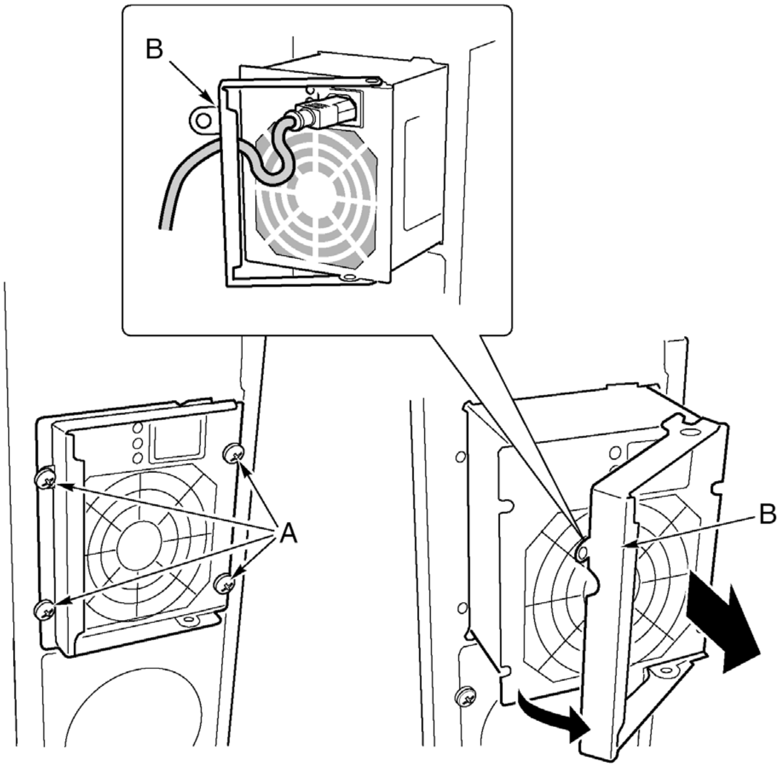


Figure 45 - Removing a power supply module

Label	Description	Label	Description
A	Screws	B	Latch handle

4 Unplug the power cord from the power supply.

5 If you are not going to install a replacement module, you must install a filler panel in the vacant slot.

To install a power supply module

1. If present, remove the filler panel from the vacant slot.
2. Holding the power supply latch handle in the open position, slide the power supply module into the vacant slot until you feel resistance.

   Caution! The module engaging its connector causes the resistance. To avoid damaging the module, do not tilt or twist the power supply module as you push it into the connector.

3. Guide the power cord through the strain relief notch in the latch handle and plug the cord into the AC power connector on the back of the power supply module.
4. Press the latch handle down to engage the latches and secure the power supply to the chassis.
5. Insert and tighten the four screws that secure the power supply module to the chassis.
6. Connect the AC power cord to the wall outlet or other AC power source.

   The green LED on the power supply module should be illuminated.

Cooling system fans

The Altos G900 server accommodates six hot-swap fan modules.

Caution! Don't remove a fan module while the server is powered on unless you have a replacement unit available. Once you remove a fan module from the system, replace it within five minutes. Vacant spaces alter airflow patterns in the server system and can cause overheating and damage to system components.

Checking a fan status indicator

Fault LED indicators for each fan module are located on the fan board. The indicators are visible through a cutout in the housing of each module.

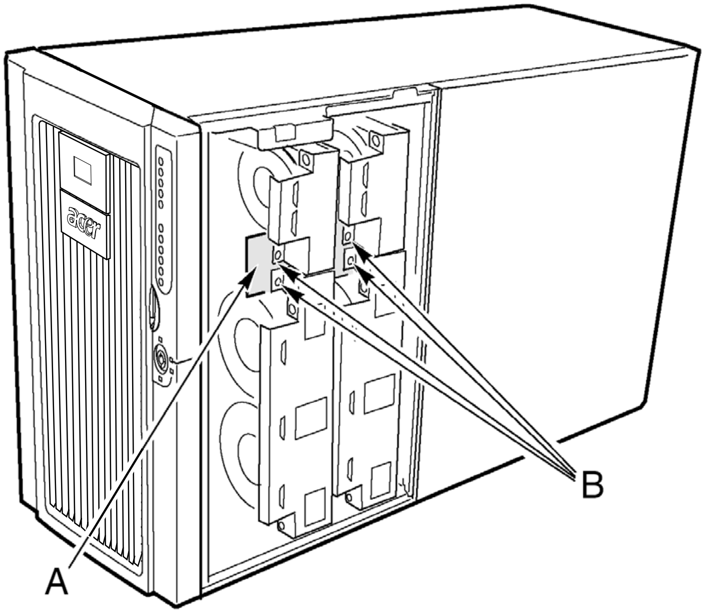


Figure 46 - Fan status indicators

Label	Description	Label	Description
A	Fan board	B	Fan status LED indicators

The red LEDs light to indicate a fan failure; during normal operation, the LEDs remain unlit. A fan failure is also indicated by the general system fault LED located on the front panel.

Removing and installing a fan module

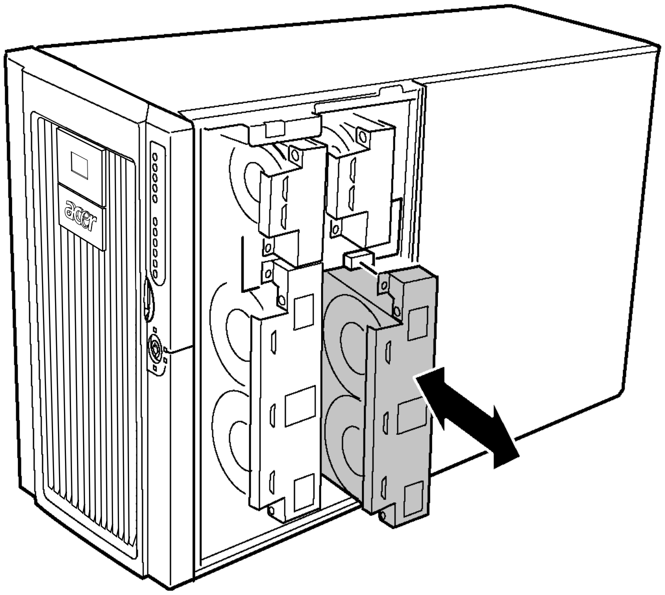


Figure 47 - Removing and installing a fan module

To remove a fan module

1 Remove the front access panel (refer to page 46).

2 Grasp the fan module and pull it straight out of the foam baffle.

To install a fan module

Note: If you are replacing a failed fan module, wait for the fan status LED to turn off. Generally, this will take less than ten seconds.

1 Remove the front access panel (refer to page 46).

2 Place the fan module into the empty slot of the fan assembly so that the fan connector mates with the connector on the fan board.

3 Press down firmly to seat the fan module fully into the connector.

4 Check the fan status LED for the replacement fan.

If the installation was successful, the indicator will not be lit.

5 Reinstall the front access panel (refer to page 46).

Backup battery

The lithium battery on the mainboard powers the real-time clock (RTC) in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) might be incorrect.

For a list of approved replacement batteries, contact your customer service representative or dealer.

Warning! Danger of explosion if battery is incorrectly replaced. Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Replacing the battery

1. Before proceeding, record your custom BIOS settings.
2. Disconnect the AC power cords from the power source or wall outlets.
3. Turn off all peripheral devices connected to the server system.
4. Remove the following:
   a. Rear access panel - refer to page 44
   b. System board access panel - refer to page 51
   c. Memory board - refer to page 52
   d. Air baffle - refer to page 54
   e. Processor board - refer to page 55
5. Slide the battery in the direction shown in Figure 44, allowing the battery to pop up.

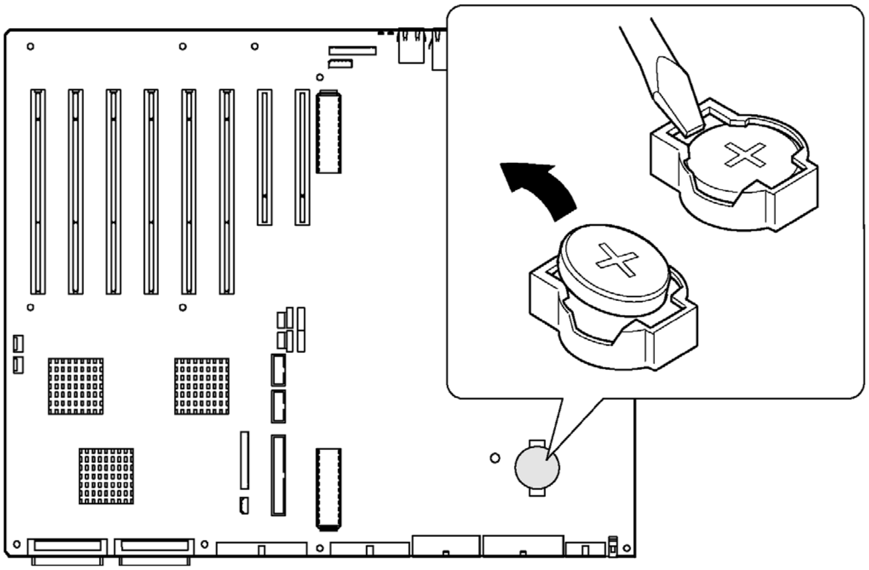


Figure 48 - Removing the battery

6 Remove the battery from its socket.

7 Dispose of the battery according to local ordinance.

8 Remove the new lithium battery from its package.

9 Being careful to observe the correct polarity, lay the battery in the socket, inserting one edge of the battery under the large corner tabs.

10 Push the battery down until it locks into the socket.

11 Reinstall the processor board, air baffle, memory board, system board access panel, and the rear access panel.

12 Run BIOS setup to restore the configuration settings to the RTC.

13 Restore your custom BIOS settings.

Front panel board

For a description of the features on the front panel board, see “Front control panel” on page 8.

Installing the front panel board

1 Turn off power to the server and unplug the AC power cords from the power source.

2 Remove the front access panel (refer to page 46).

3 Remove the fan modules and the foam fan baffle (refer to page 88).

4 Disconnect the cables from the front panel board: the front panel board ribbon cable, the intrusion switch cables, the USB cable, and the serial port cable (refer to page 91).

One end of the front panel board is inserted into a slot in the front subchassis and the other end is secured with a screw and a snap-top standoff.

5 Remove the screw that secures the front panel board to the front of the chassis.

6 Grasp the end of the board closest to the side of the chassis and pull to disengage the board from the standoff.

7 Gently slide the board out of the slot in the front subchassis.

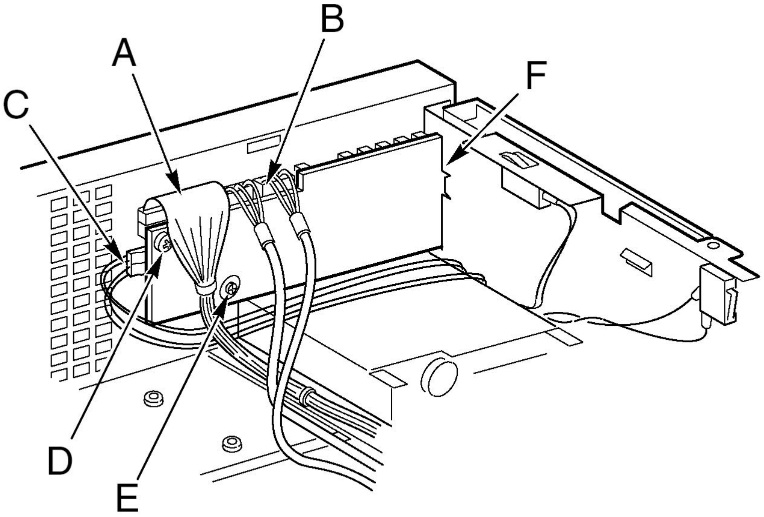


Figure 49 - Replacing the front panel board

Label	Description	Label	Description
A	Front panel board cable	D	Screw
B	USB and serial port cables	E	Snap-top standoff
C	Chassis intrusion cables	F	Slot in chassis

8 Slide the notched end of the new front panel board into the slot in the front subchassis.

9 Position the board so the snap-top standoff on the front of the chassis is aligned with the hole in the front panel board and press the board over the standoff.

10 Insert and tighten the mounting screw to secure the board to the front subchassis.

11 Reconnect the cables to the front panel board: the front panel board ribbon cable, the intrusion switch cables, the USB cable, and the serial port cable.

12 Install the foam fan baffle and the fan modules.

13 Install the front access panel.

Diskette drive

Replacing the diskette drive

1 Turn off power to the server and unplug the AC power cords from the power source.

2 Remove the front access panel (refer to page 46).

3 Remove the fan modules and the foam fan baffle (refer to page 88).

4 Disconnect the power and signal cables from the back of the diskette drive.

5 Remove the screw that secures the diskette drive bracket to the chassis.

6 Remove the bracket and drive assembly from the inside of the front subchassis.

7 Position the drive and bracket so that the bottom of the bracket is facing up.

8 Holding the front of the drive with one hand, tilt the front of the bracket up to disengage the locating pins on each side of the bracket from the drive.

9 Slide the bracket back and remove it from the drive.

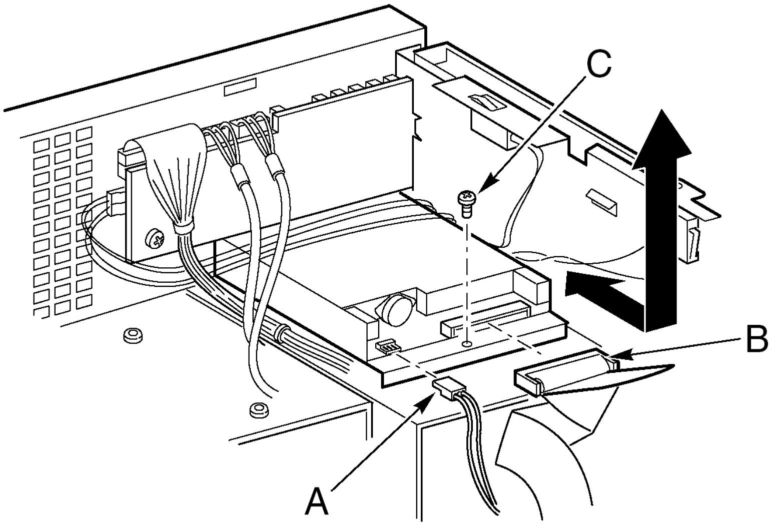


Figure 50 - Removing the diskette drive

Label	Description
A	Power cable
B	Data cable
C	Screw

Note: If you are not installing a replacement device, install a metal EMI shield on the bay to maintain proper cooling and EMI shielding.

10 Remove the new diskette drive from its protective wrapper and place it on an antistatic surface.

11 Record the drive model and serial numbers in your equipment log.

For a sample equipment log sheet, refer to page 197.

12 Set any jumpers or switches according to the drive manufacturer instructions.

13 Position the new drive with the component side up and slide the back of the drive under the ears at the back of the bracket.

14

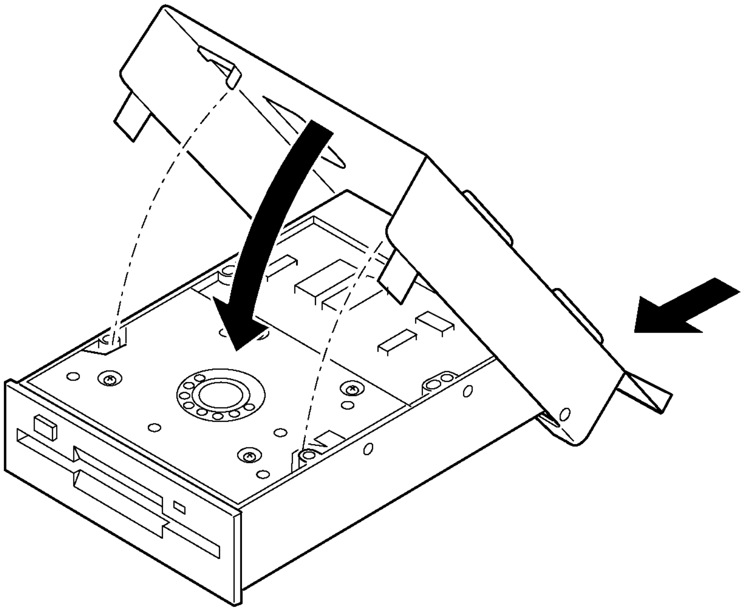


Figure 51 - Inserting a diskette drive into the bracket

15 Slide the bracket toward the front of the drive and engage the locating pins on each side of the bracket in the mating holes in the drive frame.

16 Position the bracket and drive so that the front of the drive fits correctly in the opening in the front subchassis and the mounting screw hole in the back of the bracket is aligned with the mating hole in the front subchassis.

17 Tighten the mounting screw to secure the drive and bracket to the front subchassis.

18 Connect the signal and power cables to the drive. The connectors are keyed to fit only one way.

19 Install the fan baffle and fan modules.

20 Install the front access panel.

5.25-inch peripheral drives

This section provides information and instructions for installing and removing devices from the 5.25-inch peripheral bay.

Preliminary considerations

Caution! You should not install hard drives in the 5.25-inch peripheral drive bays for two reasons:
- The drives cannot be properly cooled in this location.
- The total EMI from the server might exceed allowable limits, because the hard drive generates additional EMI.

Drive cables

This section summarizes the drive cable requirements and constraints. The number of peripheral drives you can install depends on:

- The number supported by the bus
- The number of drive bays available
- The height of drives in the bays (1-inch or 1.6-inch high)
- The combination of SCSI and IDE devices

IDE requirements

The server includes an IDE controller and a cable that supports two devices. One of the two connectors on the cable is already used for the CD-ROM drive. The CD-ROM device is configured for Cable Select (CS) and is at the end of the cable; this defines the CD-ROM as the IDE master. If you install a second IDE device, and it is jumpered for Cable Select, connect the device on the middle IDE connector to configure the device as IDE slave, or at the end of the cable to configure the device for IDE master.

SCSI requirements

The server includes a two-channel SCSI controller. One channel is used for the hot-swap drive bay. If you don't use the second channel for adding a second hot-swap drive bay, you may use that channel for SCSI devices in the peripheral bay. SCSI cabling and connections must meet the SCSI bus specification. Otherwise, the bus might be unreliable and data might become corrupted or devices might not work properly.

EMC compliance of 5.25-inch removable media device bays

Integration of the 5.25-inch peripheral drive bay can affect EMC compliance and is a regulated activity. Except as noted here, any changes to the bay configuration could result in non-compliance with EMC regulations in your area.

Removing and installing a 5.25-inch peripheral drive

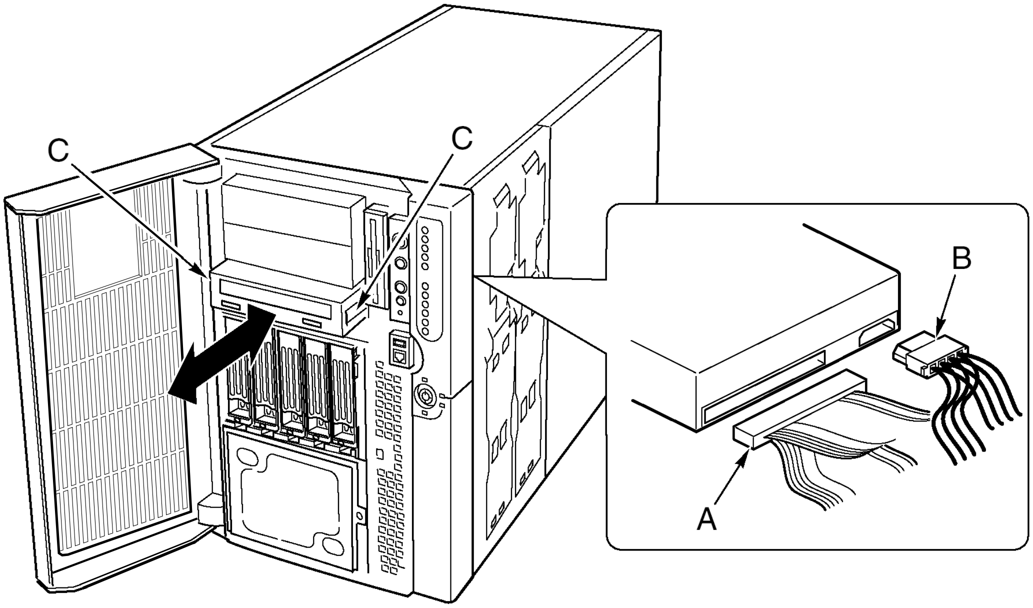


Figure 52 - Removing and installing a 5.25-inch peripheral drive

Label	Description
A	Data cable
B	Power cable
C	Slide rails

To remove a a 5.25-inch peripheral drive

1. Turn off power to the server and unplug the AC power cords from the power source.
2. Remove the front access panel (refer to page 46).
3. Remove the fan modules and the foam fan baffle (refer to page 88).
4. Disconnect the power and data cables from the back of the drive.
5. Facing the front of the drive, press in on the two black plastic tabs (one on each side of the drive) to release the drive from the drive bay.
6. Carefully slide the drive out of the bay and place it on an antistatic surface.
7. Remove the four screws that secure the two slide rails to the drive. Save the screws and slide rails.
8. If you are installing a replacement device, skip to step 6 of the next section to install that device.
9. Install the foam fan baffle, the fan modules, and the front access panel.

Note: If you are not installing a replacement device, install a metal EMI shield on the bay to maintain proper cooling and EMI shielding.

To install a 5.25-inch peripheral drive

Caution! To avoid damage to a 5.25-inch peripheral drive, ensure that the EMI gasket provided in the front of the lower bay does not bridge or short any open circuits on the peripheral drive. If the drive has open circuits, install it in one of the two upper peripheral drive bays.

1. Turn off power to the server and unplug the AC power cords from the power source.
2. Remove the front access panel (refer to page 46).
3. Remove the fan modules and the foam fan baffle (refer to page 88).

4 If the drive bay is covered by a metal EMI shield, insert your finger in the large hole in one end of the shield and pull the shield from the chassis. Save the shield.

5 If the drive bay has an existing drive installed, remove the drive (see page 98) and remove the slide rails attached to the sides of the drive. Save the rails and screws.

6 Remove the new drive from its protective wrapper and place it on an antistatic surface.

7 Record the new drive model and serial numbers in your equipment log.

For a sample equipment log sheet, refer to page 197.

8 Set any jumpers or switches on the new drive according to the drive manufacturer instructions.

9 Attach a slide rail to each side of the drive using two mounting screws.

10 Position the drive so the plastic slide rails engage the guide rails in the peripheral bay. Push the drive into the bay until the slide rails lock in place.

11 Connect the signal and power cables to the drive. You can insert the keyed connectors only one way.

12 Install the foam fan baffle, fan modules, and the front access panel.

Hot-swap drive bays

The hot swap drive bay assemblies come with a backplane board and a fan. Each drive slot contains a drive carrier with a plastic air baffle.

Removing and installing a hot-swap drive bay

To remove a hot-swap drive bay

1 Turn off power to the server and unplug the AC power cords from the power source.

2 Open and remove the front subchassis (refer to page 47 and 48).

3 Remove the fan modules and the foam fan baffle (refer to page 88).

4 Remove the four screws (two on each side) that secure the drive bay assembly to the front subchassis.

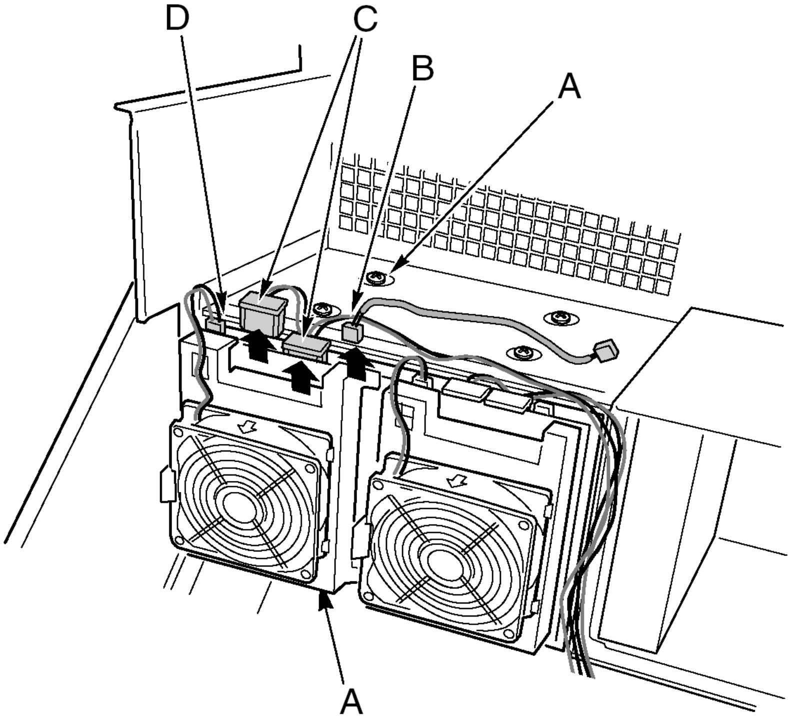


Figure 53 - Removing a hot-swap drive bay

Label	Description	Label	Description
A	Screws	C	Power cables
B	I^2C cable	D	Fan cable
C	Chassis intrusion cables	F	Slot in chassis

Note: Although not necessary, for easier handling, you might want to remove any drives installed in the drive bay assembly before proceeding.

5 If both hot swap drive bays are installed, loosen two of the screws that secure one side of the other drive bay to the front subchassis. Loosening the other drive bay allows the drive bay enclosure to expand slightly, making it easier to remove the drive bay assembly.

6 Grasp the fan housing on the back of the drive bay assembly and pull the drive bay assembly out the back of the front subchassis.

7 If you are installing a replacement drive bay, skip to step 5 of the next section to install that device.

8 Install the foam fan baffle and fan modules (refer to page 88).

9 Install and close the front subchassis (refer to page 49 and page 50).

10 Install the front access panel (refer to page 46).

Note: If you are not installing a replacement drive bay, install a metal EMI shield on the opening in the front of the chassis for proper cooling and EMI shielding.

To install a hot-swap drive bay

1 Turn off power to the server and unplug the AC power cords from the power source.

2 Open and remove the front subchassis (refer to page 47 and 48).

3 Remove the fan modules and the foam fan baffle (refer to page 88).

4 If another hot-swap drive bay is already installed, loosen two of the screws that secure one side of the other drive bay to the front subchassis. Loosening the other drive bay allows the drive bay enclosure to expand slightly, making it easier to remove the drive bay assembly.

5 From the back of the front subchassis, grasp the rear fan housing and carefully slide the front end of the drive bay assembly into the drive bay enclosure.

6 Tighten the four screws (two on each side) that secure the drive bay assembly to the front subchassis and tighten the screws on the other drive bay assembly loosened in step 4.

7 Connect the cables to the drive bay assembly backplane.

8 Install the foam fan baffle and fan modules (refer to page 88).

9 Install and close the front subchassis (refer to page 49 and page 50).

10 Install the front access panel (refer to page 46).

Power distribution board

Replacing the power distribution board

1. Remove the front and rear access covers (refer to page 46 and page 44).
2. Open the front subchassis and remove the electronics bay (refer to page 47 and page 49).
3. Partially remove the power supplies (refer to page 84) to disengage the power supply connectors from the power distribution board.
4. Disconnect the cables from the power distribution board.
5. Remove the four screws that secure the power distribution board to the main chassis.
6. Grasp the edge of the power distribution board and plastic overlay along the edge where the screw holes are located. Lift the edge, tilting the board about 30°. Pull up on the board to free the holes on the opposite edge from the tabs on the chassis and slide the board free

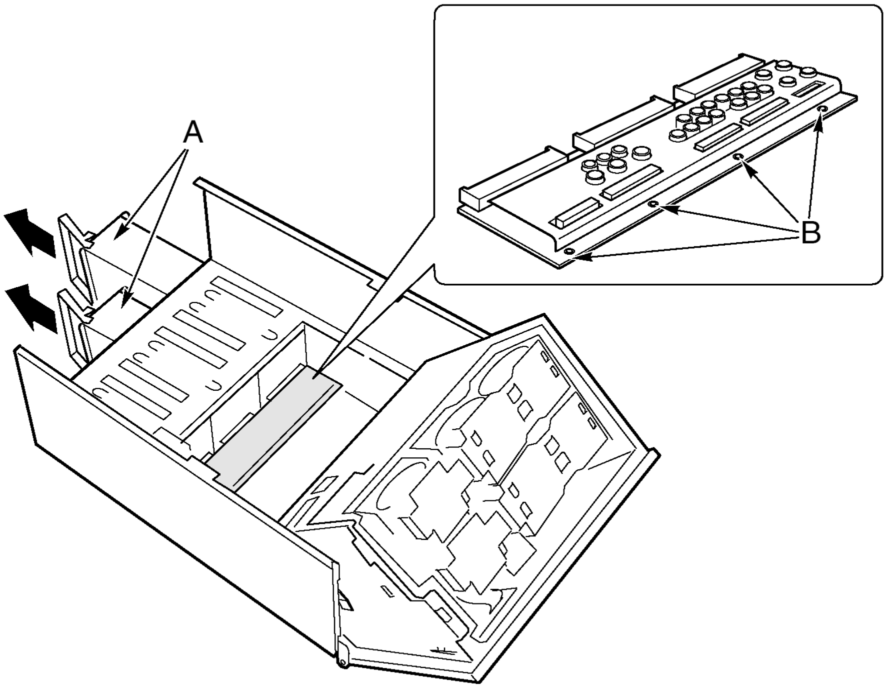


Figure 54 - Removing a power distribution board

Label	Description	Label	Description
A	Power supply module	B	Screws

7

8. Remove the two plastic rivets and the plastic overlay from the power distribution board.
9. Attach the plastic overlay to the new power distribution board using the two plastic rivets.
10. Grasp the new power distribution board and overlay with the power supply connectors facing the power supply bays.
11. Tilt the edge of the power distribution board in your hand about 30° and gently slide the other edge of the board into the four slots in the power supply bays.
12. When the board is inserted all the way into the slots, tilt the board down so the four mounting holes on the edge of the board are aligned with the corresponding holes in the main chassis.
13. Tighten the four screws to secure the power distribution board to the main chassis.
14. Install the power supplies.
15. Install the electronics bay (refer to page 49).
16. Connect the cables to the power distribution board and mainboard.
17. Close the front subchassis and electronics bay.
18. Install the front and rear access covers (refer to page 46 and page 45).

Fan distribution board

The fan distribution board is located in the foam fan baffle and provides power and signal circuitry for the hot-swappable fans.

Replacing the fan distribution board

1. Remove the front access panel (page 46).
2. Remove all fan modules from the foam fan baffle (page 88).
3. Remove the mainboard ribbon cable and the power cable from the fan distribution board.
4. Gently press outward on two corners of the foam (Figure 55, A) to spread open the fan distribution board slot in the foam fan assembly, rotate the edge of the board free, and lift the board out of the foam air baffle.

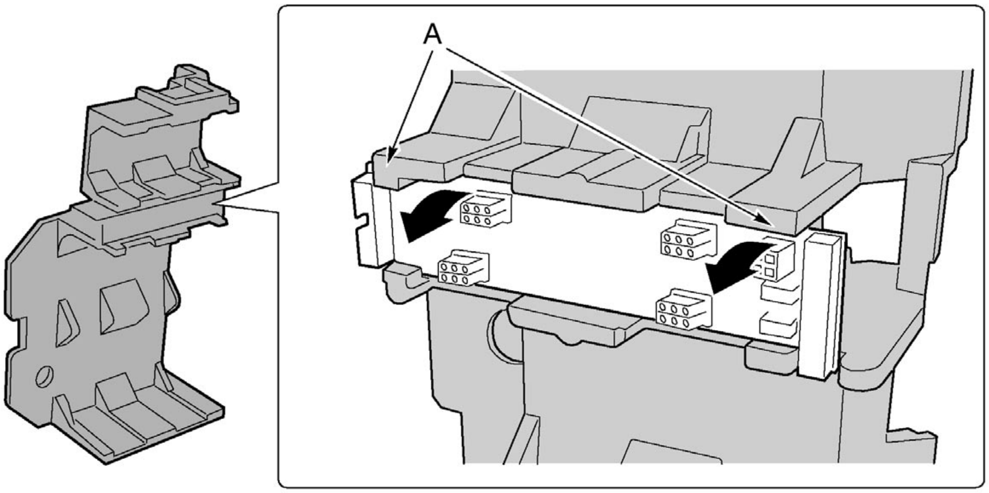


Figure 55 - Removing a fan distribution board

5. Place the fan distribution board with the component side up on a nonconductive, static-free surface or in an antistatic bag.
6. Grasp the edges of the new fan distribution board with the component side up and the end with the power and mainboard connectors facing the rear of the server.
7. Tilt one edge of the board up about 30°, and slide the other edge into place in the foam fan baffle.

8 Gently press outward on two corners of the foam to spread open the fan distribution board slot in the foam fan baffle and rotate the board into place.

9 Connect the mainboard ribbon cable and the power cable.

10 Install the fan modules.

11 Install the front access panel.

Foam fan baffle

Removing and installing the foam fan baffle

To remove the foam fan baffle

1 Remove the front access panel (page 46).

2 Remove all fan modules from the foam fan baffle (page 88).

3 Remove the fan distribution board (page 105).

4 Gently bend the ends of the foam baffle (Figure 56, A) toward each other to release the baffle notches from the tabs of the front subchassis.

5 Carefully lift the fan baffle from the front subchassis.

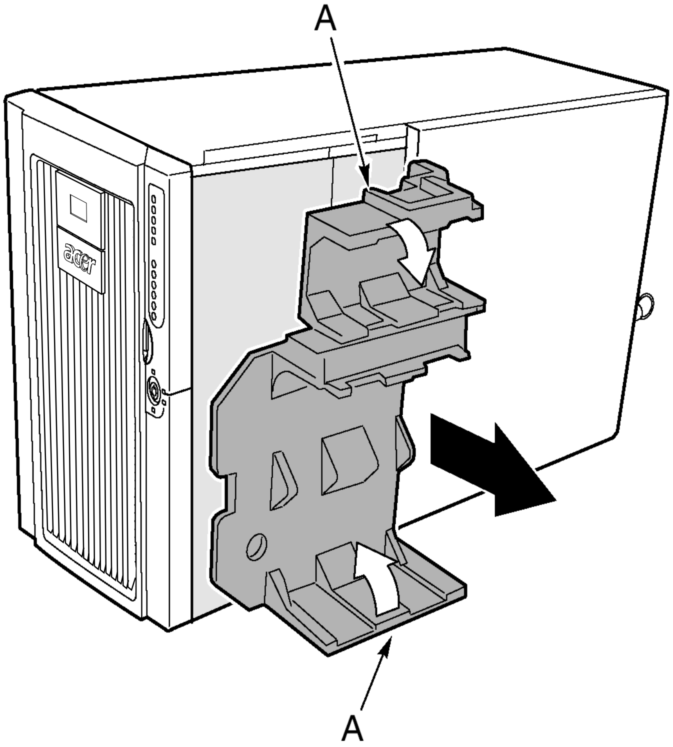


Figure 56 - Removing the fan baffle

To install the foam fan baffle

1. Position the fan baffle so the holes in the bottom of the baffle are aligned with the four hot swap drive bay mounting screws (or holes) in the front subchassis.
2. Gently bend back the ends of the foam baffle (Figure 56, A), then push down and slide the baffle straight into the chassis until the tabs on the front subchassis mate with the corresponding notches in the baffle.
3. Install the fan distribution board.
4. Install the fan modules.
5. Install the front access panel.

Hot-plug indicator board

Replacing the hot-plug indicator board

1. Remove the rear access panel (refer to page 44).
2. Disconnect the ribbon cable from the end of the hot-plug indicator board.
3. Remove the two plastic rivets that secure the board to the electronics bay (Figure 57, C).
4. The end of the board where the cable attaches is inserted into a notch in the chassis. Tilt out the free end of the board and lift the board out of the notched bracket in the back of the electronics bay. Two plastic rivet inserts remain in the mounting holes in the chassis.

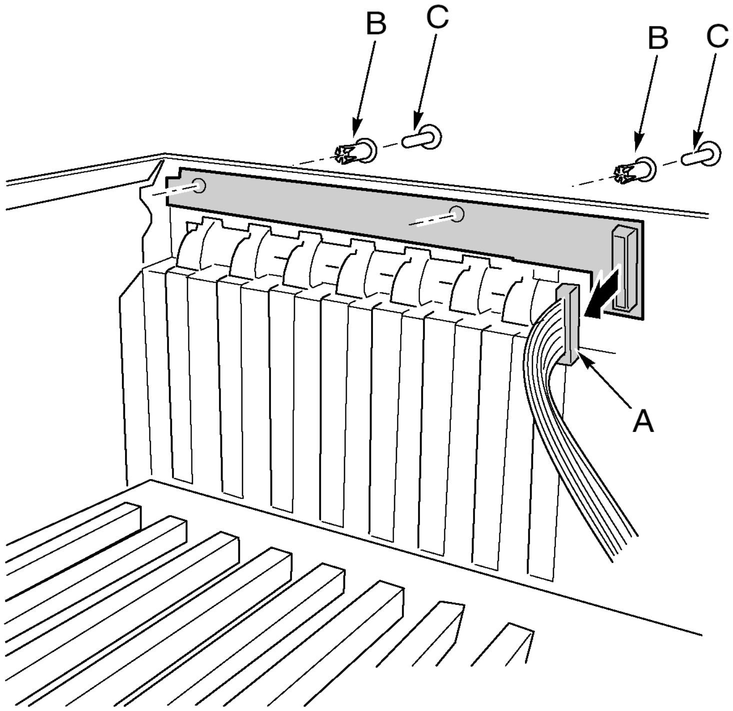


Figure 57 - Removing the hot-plug indicator board

Label	Description
A	Ribbon cable

Label	Description
B	Rivet sleeve
C	Rivet

5 Place the end of the new hot-plug indicator board into the notched bracket in the back of the electronics bay.

6 Align the plastic rivet sleeves in the chassis back panel with the two mounting holes in the board and press the sleeves into the holes.

7 Insert the two plastic rivets into the mating sleeves and snap the rivets down to secure the board to the electronics bay.

8 Connect the ribbon cable to the mating connector on the hot-plug indicator board.

4 BIOS setup

This chapter gives information about the system BIOS and discusses how to configure the system by changing the settings of the BIOS parameters.

BIOS setup

Use BIOS setup to change the system configuration defaults. You can run BIOS setup with or without an operating system being present. BIOS setup stores most of the configuration values in the battery-backed CMOS; the remainder are stored in flash memory. The values take effect when the system is booted. POST uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message. You must run BIOS setup to change the BIOS settings from the default or current configuration.

Run BIOS setup to modify server board set features such as:

- Defining the diskette drive
- Defining the serial ports
- Setting the system time and date
- Configuring the hard drives
- Specifying the boot device sequence
- Enabling the SCSI BIOS
- Setting up system passwords

Using either BIOS setup or the System Setup Utility (refer to page 168), you can set up system passwords, specify the boot device sequence, and enable some server management features. Both utilities access the same stored configuration data for these items, and the result of making a change to these settings using either utility is identical.

Recording BIOS settings

Record your BIOS setup settings. If your custom values ever need restoring (after a CMOS clear, for example), you must run BIOS setup and enter your custom settings again. A record of any custom settings will make this much easier.

Clearing CMOS memory

If you need to clear CMOS memory, you can use either of these two methods:

- Use the front panel buttons
- Use the CMOS Clear jumper

To clear the CMOS memory using the front panel buttons

1. Power down the server.
2. Press the Reset button and hold it down for four seconds or more; while holding down the reset button, press the power button.
3. Release both buttons at the same time.

To clear the CMOS memory using CMOS Clear jumper

1. Power down the server.
2. Install a jumper on the CMOS Clear jumper pins.
3. Boot the system.
4. Power down the system and remove the jumper from the CMOS Clear pins.

The next time the system is started following the CMOS clear, the boot process halts displaying the message NVRAM cleared by jumper.

Using BIOS setup

To run BIOS setup, boot the server and press the **F2** key when prompted.

Use the keys listed in the table below to navigate through the BIOS setup menus.

Press:	To:
F1 or Alt+H	Get general help
®	Move between menus
-	Go to the previous item
-	Go to the next item
+ or -	Change the value of an item
Enter	Select an item or display a submenu
Esc	Leave a submenu or exit BIOS setup

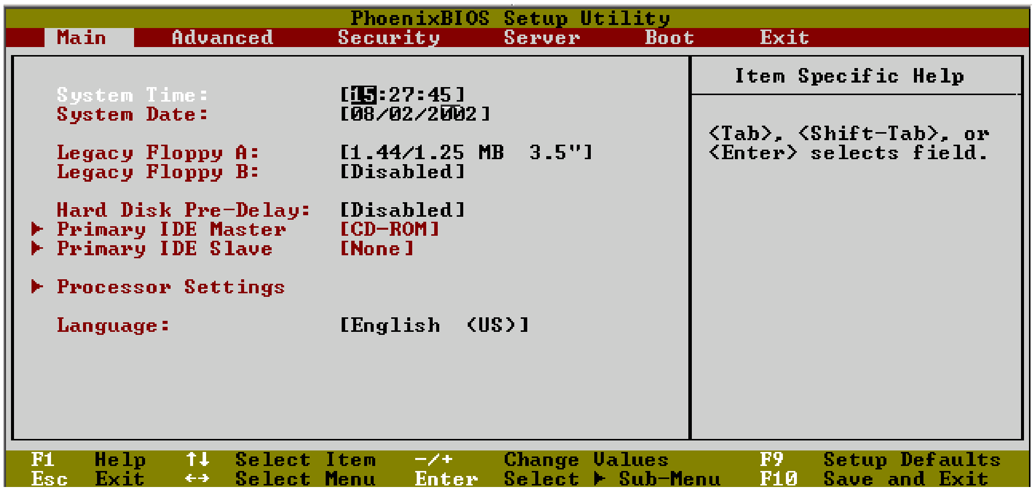
Press:	To:
F9	Reset to BIOS setup defaults
F10	Save and exit BIOS setup

When an option is grayed out and not accessible, you cannot change or configure the option in that menu screen for one of the following reasons:

- The option is auto-configured or auto-detected.
- The field is informational only.
- The field is password-protected and is accessible only by the User or Administrator.

Main

The Main menu displays basic and important information about the system. These information is necessary for troubleshooting and may be required when asking for technical support.



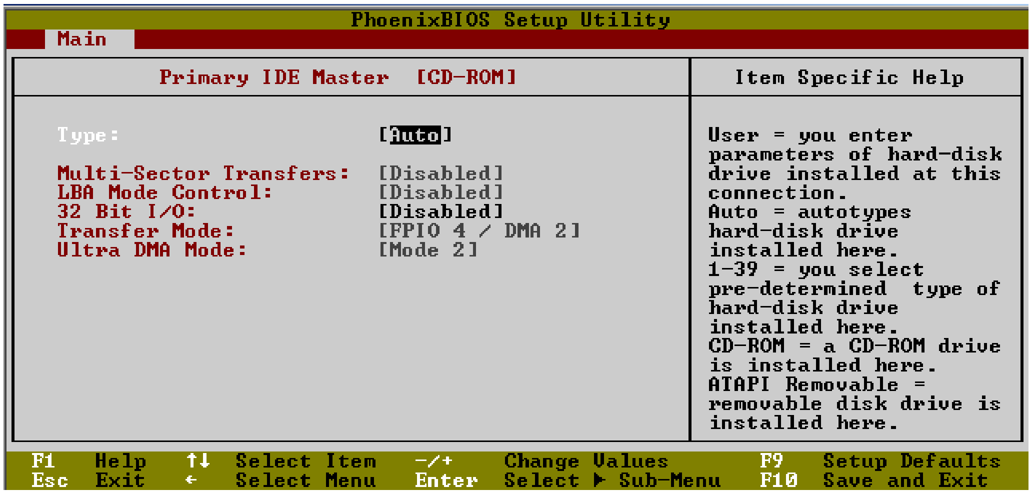
```
                           PhoenixBIOS Setup Utility
   Main      Advanced      Security      Server      Boot      Exit

    System Time:             [15:27:45]               Item Specific Help
    System Date:             [08/02/2002]
                                                   <Tab>, <Shift-Tab>, or
    Legacy Floppy A:         [1.44/1.25 MB  3.5"]  <Enter> selects field.
    Legacy Floppy B:         [Disabled]

    Hard Disk Pre-Delay:     [Disabled]
  ▶ Primary IDE Master       [CD-ROM]
  ▶ Primary IDE Slave        [None]

  ▶ Processor Settings

    Language:                [English  (US)]

 F1   Help  ↑↓  Select Item  -/+    Change Values       F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu   F10  Save and Exit
```

Parameter	Description	Option
System TIme	Sets the time following the hour-minute-second format.	Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59
System Date	Sets the date following the weekday-month-day-year format.	Weekday: Sun to Sat Month: Jan to Dec Day: 1 to 31 Year: 1980 to 2079
Legacy Floppy A	Selects floppy disk drive A type	Disabled 1.2 MB, 5.25-inch 720 KB, 3.5-inch **1.44/1,25 MB, 3.5-inch** 2.88 MB, 3.5-inch
Legacy Floppy B	Selects floppy disk drive B type	**Disabled** 1.2 MB, 5.25-inch 720 KB, 3.5-inch 1.44/1,25 MB, 3.5-inch 2.88 MB, 3.5-inch

Parameter	Description	Option
Hard Disk Pre-delay	Sets an interval time between boot up and BIOS access of the hard drive. This is to prevent the system from hanging up when BIOS accessed it prior to drive initialization.	**Disabled** 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds
Primary IDE Master	Press **Enter** to access the Primary IDE Master submenu.	
Primary IDE Slave	Press **Enter** to access the Primary IDE Slave submenu.	
Processor Settings	Press **Enter** to access the Processor Settings submenu.	
Language	Sets the default system language	

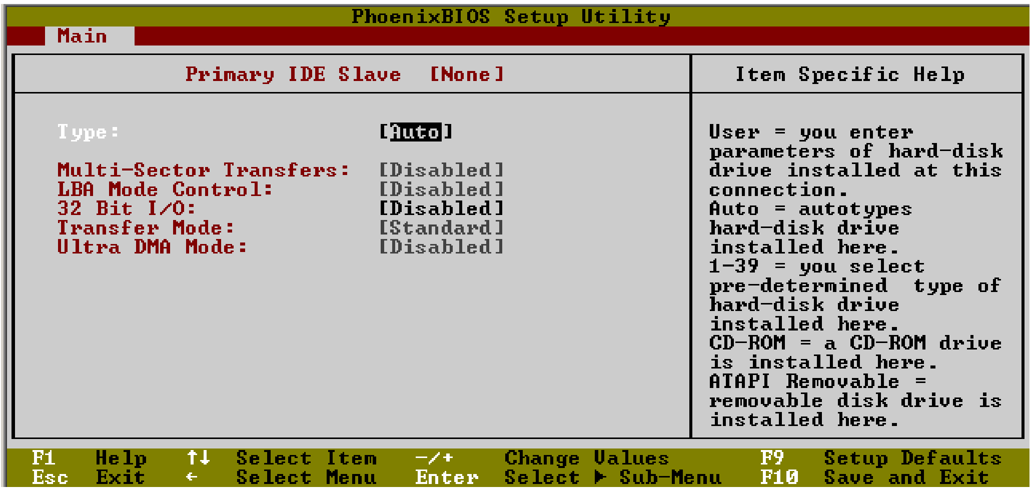
Primary IDE Master/Slave

These two IDE submenus let you define the parameter settings related to the IDE drives.



```
                          PhoenixBIOS Setup Utility
   Main
          Primary IDE Master   [CD-ROM]            Item Specific Help

   Type:                          [Auto]          User = you enter
                                                  parameters of hard-disk
   Multi-Sector Transfers:        [Disabled]      drive installed at this
   LBA Mode Control:              [Disabled]      connection.
   32 Bit I/O:                    [Disabled]      Auto = autotypes
   Transfer Mode:                 [FPIO 4 / DMA 2]  hard-disk drive
   Ultra DMA Mode:                [Mode 2]        installed here.
                                                  1-39 = you select
                                                  pre-determined  type of
                                                  hard-disk drive
                                                  installed here.
                                                  CD-ROM = a CD-ROM drive
                                                  is installed here.
                                                  ATAPI Removable =
                                                  removable disk drive is
                                                  installed here.
 F1   Help  ↑↓  Select Item   -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu   Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Primary IDE Master



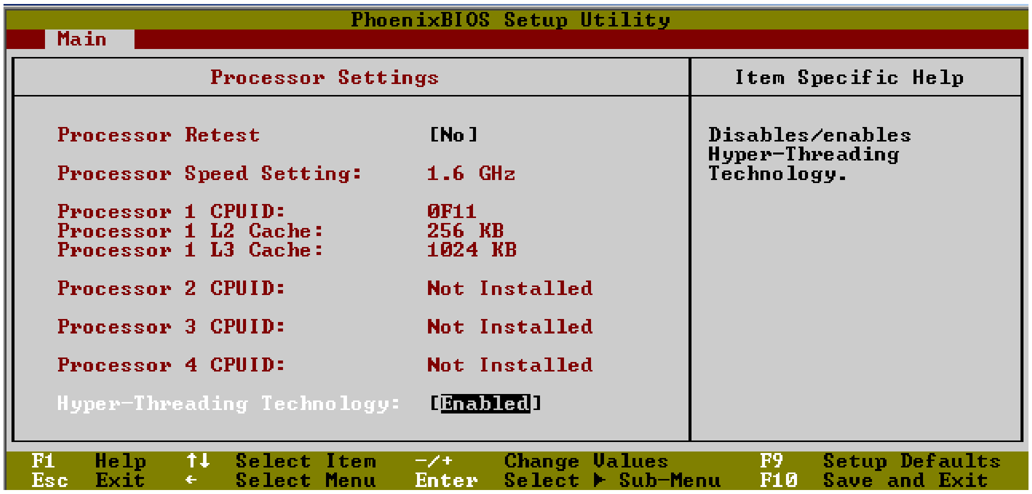
```
                          PhoenixBIOS Setup Utility
   Main
          Primary IDE Slave   [None]               Item Specific Help

   Type:                          [Auto]          User = you enter
                                                  parameters of hard-disk
   Multi-Sector Transfers:        [Disabled]      drive installed at this
   LBA Mode Control:              [Disabled]      connection.
   32 Bit I/O:                    [Disabled]      Auto = autotypes
   Transfer Mode:                 [Standard]      hard-disk drive
   Ultra DMA Mode:                [Disabled]      installed here.
                                                  1-39 = you select
                                                  pre-determined  type of
                                                  hard-disk drive
                                                  installed here.
                                                  CD-ROM = a CD-ROM drive
                                                  is installed here.
                                                  ATAPI Removable =
                                                  removable disk drive is
                                                  installed here.
 F1   Help  ↑↓  Select Item   -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu   Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Primary IDE Slave

Parameter	Description	Option
Type	Driver type	**Auto** User 1-39 CD-ROM ATAPI Removable
Multi-Sector Transfers	Enhances disk performance depending on the hard disk in use. If you set this parameter to Auto, BIOS setup automatically detects if the installed hard disk drive supports the Block Mode function. If supported, it allows data transfer in blocks (multiple sectors) at a rate of 256 bytes per cycle. If you set this parameter to Disabled, data transfer from and to the device occurs one sector at a time.	**Auto** Disabled
LBA Mode Control	Selects the hard disk drive translation method. For drivers with more than 504 MB, the LBA mode is necessary.	**Auto** Disabled
32-bit I/O	Enables or disables the 32-bit data transfer function	**Disabled** Enabled
Transfer Mode	Selects the mode of transferring data to and from the attached drive. When drive type is Auto, this parameter only displays the mode supported by the drive and is therefore non-configurable.	**Standard** FPIO1 FPIO2 FPIO3 FPIO4 FPIO 3/DMA1 FPIO 4/DMA2
Ultra DMA Mode	Selects the Ultra DMA (Direct Memory Access) mode.	**Disabled** Enabled

Processor Settings

This submenu lets you set parameter settings related to the installed processor(s).



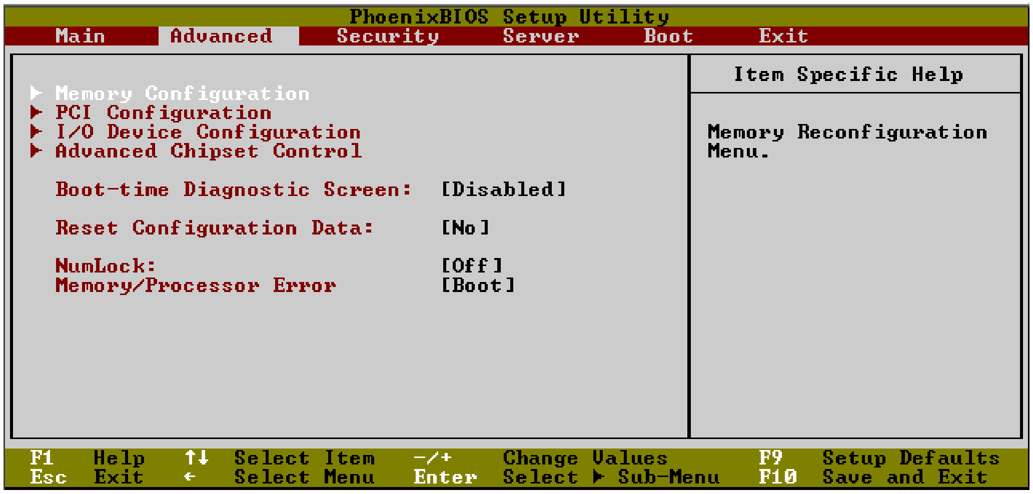
```
                         PhoenixBIOS Setup Utility
  Main
 ┌──────────────────────────────────────────┬──────────────────────┐
 │           Processor Settings             │  Item Specific Help  │
 ├──────────────────────────────────────────┼──────────────────────┤
 │                                          │                      │
 │  Processor Retest            [No]        │ Disables/enables     │
 │                                          │ Hyper-Threading      │
 │  Processor Speed Setting:    1.6 GHz     │ Technology.          │
 │                                          │                      │
 │  Processor 1 CPUID:          0F11        │                      │
 │  Processor 1 L2 Cache:       256 KB      │                      │
 │  Processor 1 L3 Cache:       1024 KB     │                      │
 │                                          │                      │
 │  Processor 2 CPUID:          Not Installed│                     │
 │                                          │                      │
 │  Processor 3 CPUID:          Not Installed│                     │
 │                                          │                      │
 │  Processor 4 CPUID:          Not Installed│                     │
 │                                          │                      │
 │  Hyper-Threading Technology: [Enabled]   │                      │
 └──────────────────────────────────────────┴──────────────────────┘
  F1   Help  ↑↓ Select Item  -/+   Change Values        F9   Setup Defaults
  Esc  Exit  ←  Select Menu  Enter Select ► Sub-Menu    F10  Save and Exit
```

Parameter	Description
Processor Retest	Clears the processors' historical status and resets all processors during the next bootup. Options include Yes and No.
Processor Speed Settings	The processor speed is the speed at which a microprocessor executes instructions. Clock speeds are expressed in megahertz (MHz), with 1 MHz being equal to 1 million cycles per second. The faster the clock, the more instructions the CPU can execute per second.
Processor 1/2/3/4 CPUID	ID number of the selected processor
Processor 1/2/3/4 L2/L3 Cache	Cache size of the selected processor
Hyper-threading Technology	Enables or disables the hyperthreading function of the processor. When enabled, one physical processor acts as two logical processors by "threading" two sets of data instructions in parallel streams for processing. The processor can then simultaneously manage incoming data from different applications without losing track of the data processing status of each.

Advanced

The Advanced menu contains parameter values that define how the system behaves on startup.

Warning! Be cautious in setting parameter values in the Advanced menu as any incorrect value may cause the system to malfunction.



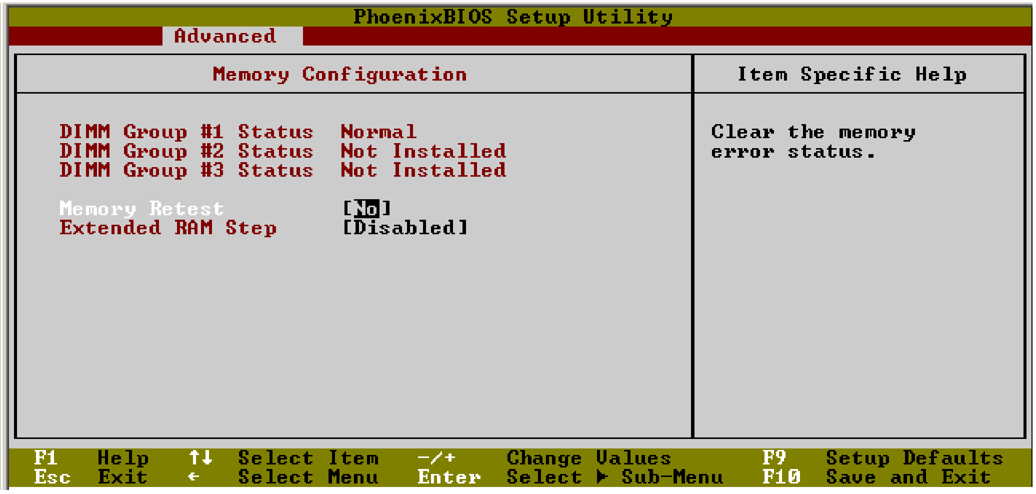
```
                          PhoenixBIOS Setup Utility
    Main      Advanced      Security     Server      Boot      Exit

  ▸ Memory Configuration                              Item Specific Help
  ▸ PCI Configuration
  ▸ I/O Device Configuration                       Memory Reconfiguration
  ▸ Advanced Chipset Control                       Menu.

    Boot-time Diagnostic Screen:  [Disabled]

    Reset Configuration Data:     [No]

    NumLock:                      [Off]
    Memory/Processor Error        [Boot]

  F1   Help  ↑↓ Select Item  -/+   Change Values       F9   Setup Defaults
  Esc  Exit  ←  Select Menu  Enter Select ▸ Sub-Menu   F10  Save and Exit
```

Parameter	Description	Option
Memory Configuration	Press **Enter** to access the Memory Configuration submenu.	
PCI Configuration	Press **Enter** to access the PCI Configuration submenu.	
I/O Device Configuration	Press **Enter** to access the I/O Device Configuration submenu.	
Advanced Chipset Control	Press **Enter** to access the Advanced Chipset Control submenu.	
Boot-time Diagnostic Screen	Select whether the BIOS diagnostic screen will be displayed during bootup or not.	**Disabled** Enabled

Parameter	Description	Option
Reset Configuration Data	Select whether to delete data stored in the ESCD (Extended System Configuration Data) area. When this parameter is set to Yes, current data is deleted.	**No** Yes
NumLock	Activates the Num Lock function upon booting.	**Off** On
Memory/ Processor Error	Select whether to boot or pause the system when a memory or processor error occurs.	**Boot** Halt

Memory Configuration

This submenu allows you to configure the advanced system memory functions.

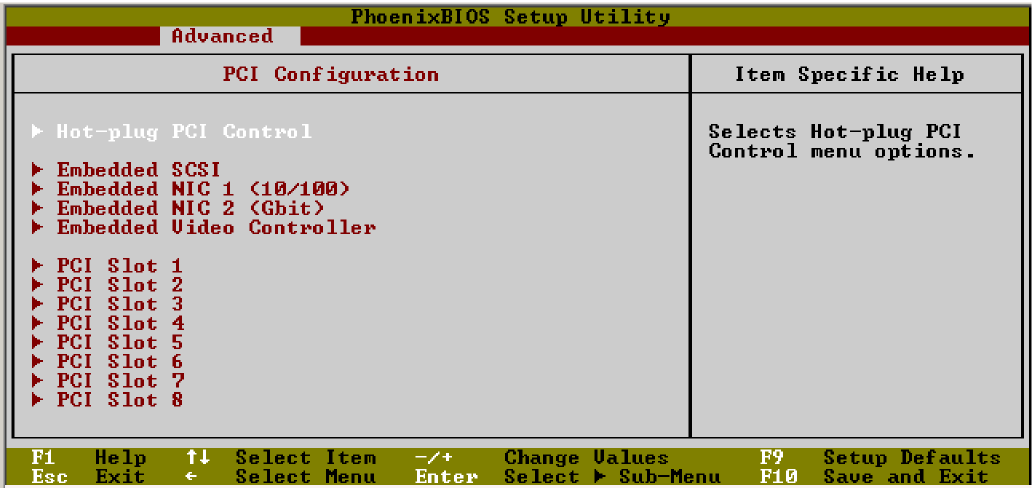


```
                         PhoenixBIOS Setup Utility
             Advanced
            Memory Configuration                     Item Specific Help

   DIMM Group #1 Status   Normal                  Clear the memory
   DIMM Group #2 Status   Not Installed           error status.
   DIMM Group #3 Status   Not Installed

   Memory Retest          [No]
   Extended RAM Step      [Disabled]

 F1   Help  ↑↓  Select Item  -/+    Change Values       F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter  Select ▸ Sub-Menu   F10  Save and Exit
```

Parameter	Description	Option
DIMM Group # 1/2/3 Status	Indicates the status of a particular bank of memory modules.	**Normal** Not Installed
Memory Retest	Clears the memory error status.	**No** Yes
Extended RAM Step	Selects the type of extended testing to perform on the RAM.	**Disabled** 1 MB 1 KB Every location

PCI Configuration

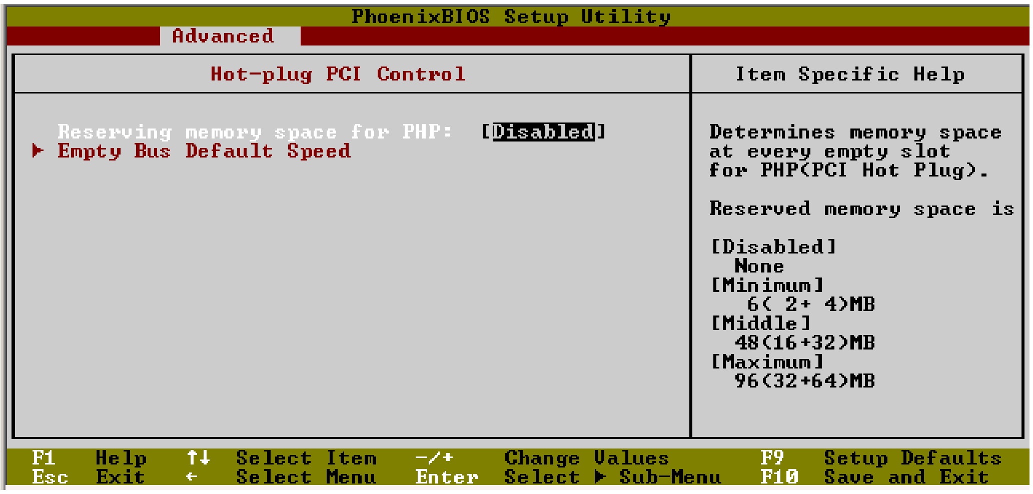
This submenu lets you specify the settings for the PCI devices. Press **Enter** to access the submenu screen of the parameters shown in the screen below.



```
                       PhoenixBIOS Setup Utility
           Advanced
              PCI Configuration                   Item Specific Help

 ► Hot-plug PCI Control                      Selects Hot-plug PCI
                                             Control menu options.
 ► Embedded SCSI
 ► Embedded NIC 1 (10/100)
 ► Embedded NIC 2 (Gbit)
 ► Embedded Video Controller

 ► PCI Slot 1
 ► PCI Slot 2
 ► PCI Slot 3
 ► PCI Slot 4
 ► PCI Slot 5
 ► PCI Slot 6
 ► PCI Slot 7
 ► PCI Slot 8

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ► Sub-Menu    F10  Save and Exit
```

Hot-plug PCI Control

This submenu lets you specify the settings for the PCI hot-plug slots.

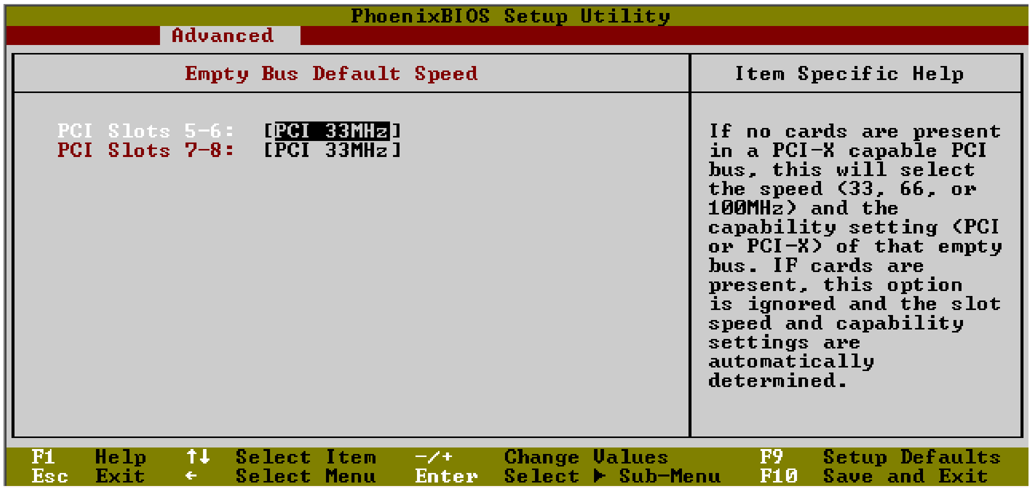


```
                         PhoenixBIOS Setup Utility
          Advanced
                 Hot-plug PCI Control                 Item Specific Help

   Reserving memory space for PHP:    [Disabled]    Determines memory space
 ▶ Empty Bus Default Speed                           at every empty slot
                                                     for PHP(PCI Hot Plug).

                                                     Reserved memory space is

                                                     [Disabled]
                                                       None
                                                     [Minimum]
                                                        6( 2+ 4)MB
                                                     [Middle]
                                                       48(16+32)MB
                                                     [Maximum]
                                                       96(32+64)MB

  F1   Help  ↑↓  Select Item  -/+    Change Values         F9   Setup Defaults
  Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu     F10  Save and Exit
```

Parameter	Description	Option
Reserving memory space for PHP	Determines the memory space to be assigned for each empty PHP (PCI Hot Plug) slot. Options include: Disabled - None Minimum - 6 < 2 + 4> MB Middle - 48 (16 + 32) MB Maximum - 96 <32 + 64> MB	**Disabled** Maximum Middle Minimum
Empty Bus Default Speed	Press **Enter** to access the Empty Bus Default Speed submenu.	

Empty Bus Default Speed

This submenu lets you specify the speed and capability settings of the PCI hot-plug slots.

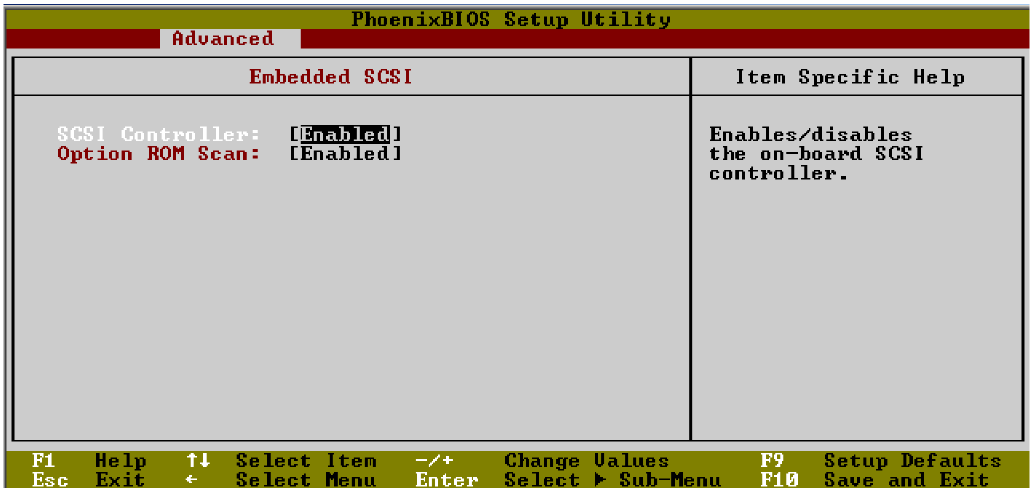


```
                         PhoenixBIOS Setup Utility
           Advanced
          Empty Bus Default Speed                 Item Specific Help

   PCI Slots 5-6:   [PCI 33MHz]               If no cards are present
   PCI Slots 7-8:   [PCI 33MHz]               in a PCI-X capable PCI
                                              bus, this will select
                                              the speed (33, 66, or
                                              100MHz) and the
                                              capability setting (PCI
                                              or PCI-X) of that empty
                                              bus. IF cards are
                                              present, this option
                                              is ignored and the slot
                                              speed and capability
                                              settings are
                                              automatically
                                              determined.

 F1   Help   ↑↓  Select Item   -/+    Change Values        F9   Setup Defaults
 Esc  Exit   ↔   Select Menu   Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Parameter	Description
PCI Slots 5 - 6 PCI Slots 7 - 8	If no card is present in any of the PCI-X capable PCI bus, the speed and capability setting will automatically be assigned. Options include: Speed: 33, 66, or 100 MHz Capability: PCI or PCI-X If a card is available, the slot and capability settings are automatically determined.

Embedded SCSI

This submenu lets you specify the settings of the onboard SCSI controller.

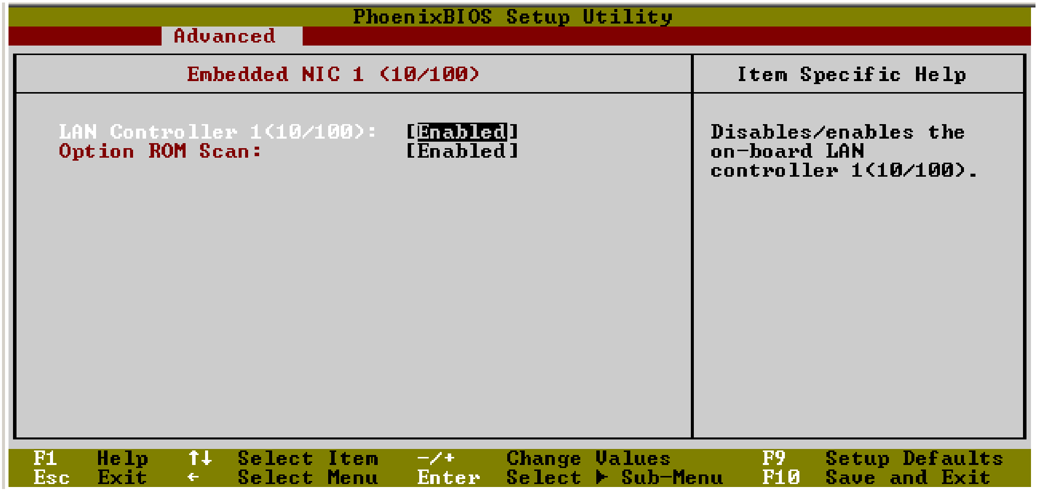


```
                    PhoenixBIOS Setup Utility
           Advanced
 Embedded SCSI                                  Item Specific Help

   SCSI Controller:   [Enabled]                 Enables/disables
   Option ROM Scan:   [Enabled]                 the on-board SCSI
                                                controller.

 F1   Help  ↑↓  Select Item   -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu   Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Parameter	Description	Option
SCSI Controller	Enables or disables the onboard SCSI controller	Disabled **Enabled**
Option ROM Scan	Initializes device expansion ROM for the onboard SCSI controller	Disabled **Enabled**

Embedded NIC 1 (10/100)

This submenu lets you specify the settings of the embedded LAN controller 1.

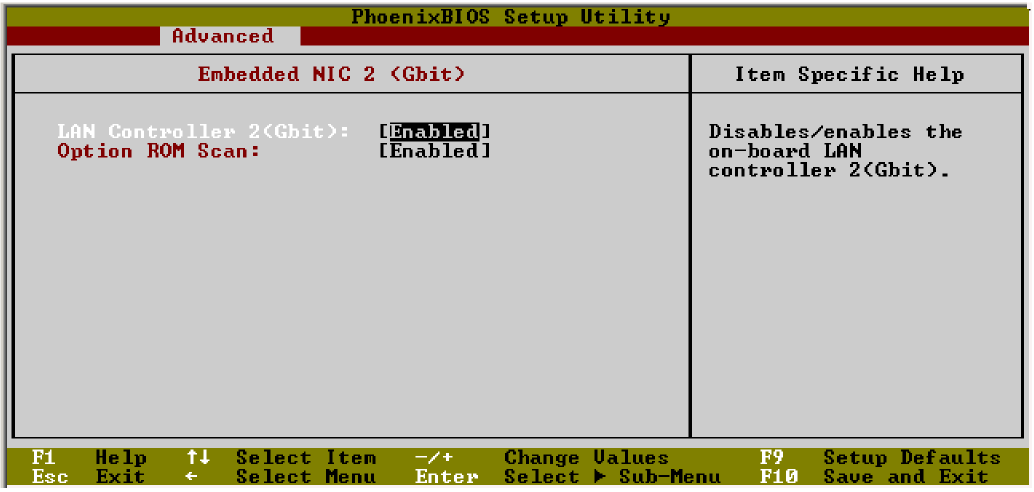


```
                    PhoenixBIOS Setup Utility
             Advanced
           Embedded NIC 1 (10/100)                  Item Specific Help

   LAN Controller 1(10/100):    [Enabled]        Disables/enables the
   Option ROM Scan:             [Enabled]        on-board LAN
                                                 controller 1(10/100).

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Parameter	Description	Option
LAN Controller 1 (10/100)	Enables or disables the onboard LAN controller for RDM function	Disabled **Enabled**
Option ROM Scan	Initializes device expansion ROM for the onboard LAN controller 1	Disabled **Enabled**

Embedded NIC 2 (Gbit)

This submenu lets you specify the settings of the embedded LAN controller 2.


PhoenixBIOS Setup Utility
Advanced
Embedded NIC 2 (Gbit)
Item Specific Help
F1 Help
Esc Exit
↑↓ Select Item
← Select Menu
-/+ Change Values
Enter Select ▶ Sub-Menu
F9 Setup Defaults
F10 Save and Exit

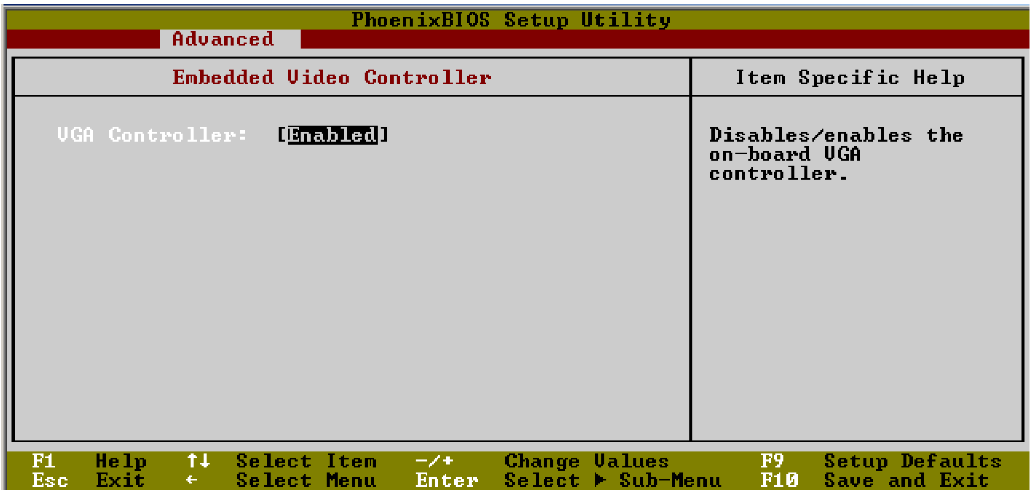
LAN Controller 2(Gbit): [Enabled]
Option ROM Scan: [Enabled]

Disables/enables the on-board LAN controller 2(Gbit).

Parameter	Description	Option
LAN Controller 2 (Gbit)	Enables or disables the onboard gigabit LAN controller	Disabled **Enabled**
Option ROM Scan	Initializes device expansion ROM for the gigabit LAN controller	Disabled **Enabled**

Embedded Voice Controller

This submenu lets you specify the settings of the embedded voice controller.



PhoenixBIOS Setup Utility

Advanced

Embedded Video Controller

VGA Controller: [Enabled]

Item Specific Help

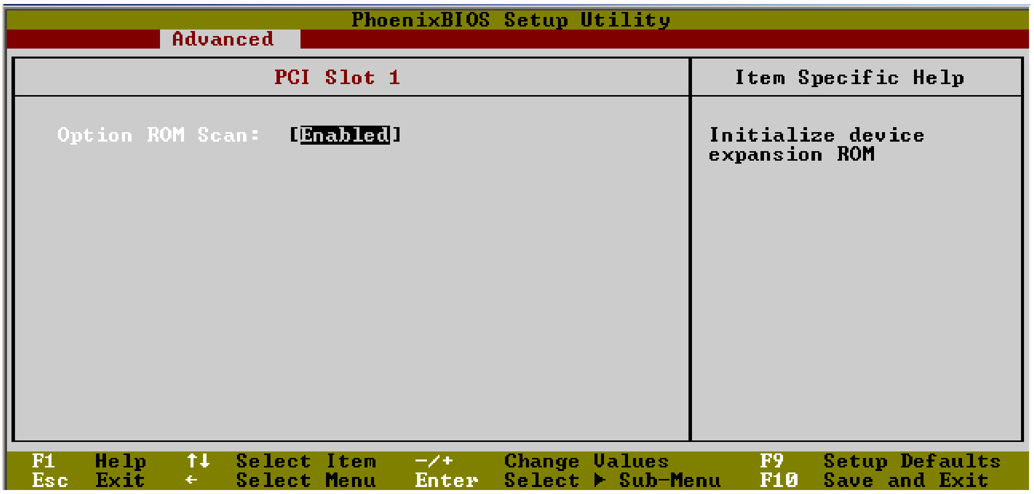
Disables/enables the on-board VGA controller.

F1 Help
↑↓ Select Item
-/+ Change Values
F9 Setup Defaults
Esc Exit
↔ Select Menu
Enter Select ▶ Sub-Menu
F10 Save and Exit

Parameter	Description	Option
VGA Controller	Enables or disables the onboard VGA controller	Disabled **Enabled**

PCI Slot 1 - 8

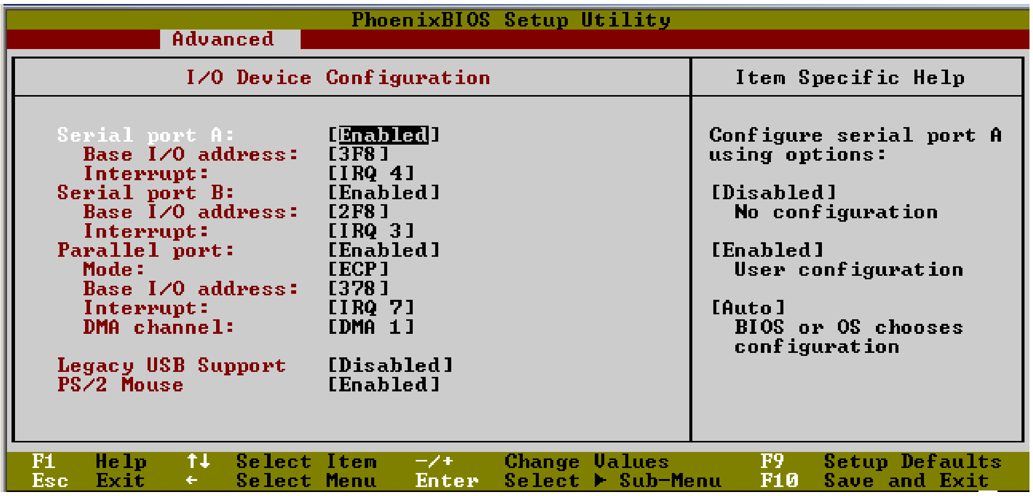
This submenu lets you initialize device expansion ROM.



```
                   PhoenixBIOS Setup Utility
          Advanced
          PCI Slot 1                          Item Specific Help

  Option ROM Scan:   [Enabled]              Initialize device
                                            expansion ROM

F1  Help  ↑↓ Select Item  -/+   Change Values       F9  Setup Defaults
Esc Exit  ←  Select Menu  Enter Select ▶ Sub-Menu   F10 Save and Exit
```

I/O Device Configuration

This submenu lets you define the parameter settings for the system's parallel and serial ports.

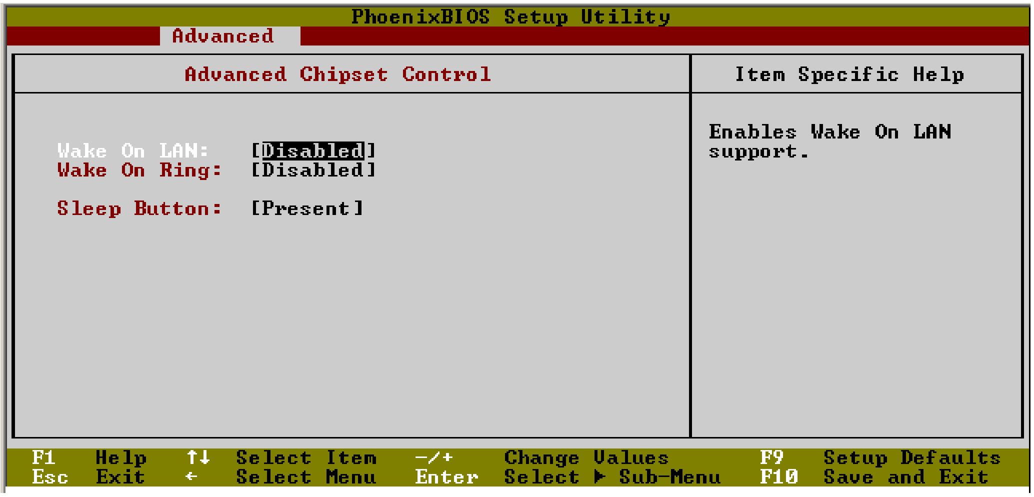


```
                   PhoenixBIOS Setup Utility
          Advanced
          I/O Device Configuration            Item Specific Help

  Serial port A:          [Enabled]         Configure serial port A
    Base I/O address:     [3F8]             using options:
    Interrupt:            [IRQ 4]
  Serial port B:          [Enabled]         [Disabled]
    Base I/O address:     [2F8]               No configuration
    Interrupt:            [IRQ 3]
  Parallel port:          [Enabled]         [Enabled]
    Mode:                 [ECP]               User configuration
    Base I/O address:     [378]
    Interrupt:            [IRQ 7]           [Auto]
    DMA channel:          [DMA 1]             BIOS or OS chooses
                                              configuration
  Legacy USB Support      [Disabled]
  PS/2 Mouse              [Enabled]

F1  Help  ↑↓ Select Item  -/+   Change Values       F9  Setup Defaults
Esc Exit  ←  Select Menu  Enter Select ▶ Sub-Menu   F10 Save and Exit
```

Parameter	Description	Option
Serial Port A/B Base I/O Address Interrupt	Base address and IRQ (interrupt request) setting for serial port A/B. Options include: Enabled - user assigned configuration Disabled - no configuration Auto - configuration is assigned by BIOS or the system operating system	Auto Disabled **Enabled**
Parallel Port Mode Base I/O Address Interrupt DMA Channel	Mode, base address, IRQ, and DMA channel for the parallel port. Mode - sets the operation mode Base address - sets a logical base address Interrupt - sets the IRQ DMA Channel - assigns a DMA (Direct Memory Access) channel for the ECP (Extended Capabilities Port) parallel port function. This parameter is configurable only if the operation mode is ECP.	Auto Disabled **Enabled**
Legacy USB Support	Enable this parameter when you intend to use a USB device and are using a non-Plug and Play operating system, such as DOS.	**Disabled** Enabled
PS/2 Mouse	Enable this parameter if you intend to use a mouse or trackball with a PS/2 interface.	Disabled **Enabled**

Advanced Chipset Control

This submenu lets you specify the settings for the system's wake-up functions .



PhoenixBIOS Setup Utility

Advanced

Advanced Chipset Control

Item Specific Help

```
Wake On LAN:      [Disabled]
Wake On Ring:     [Disabled]

Sleep Button:     [Present]
```

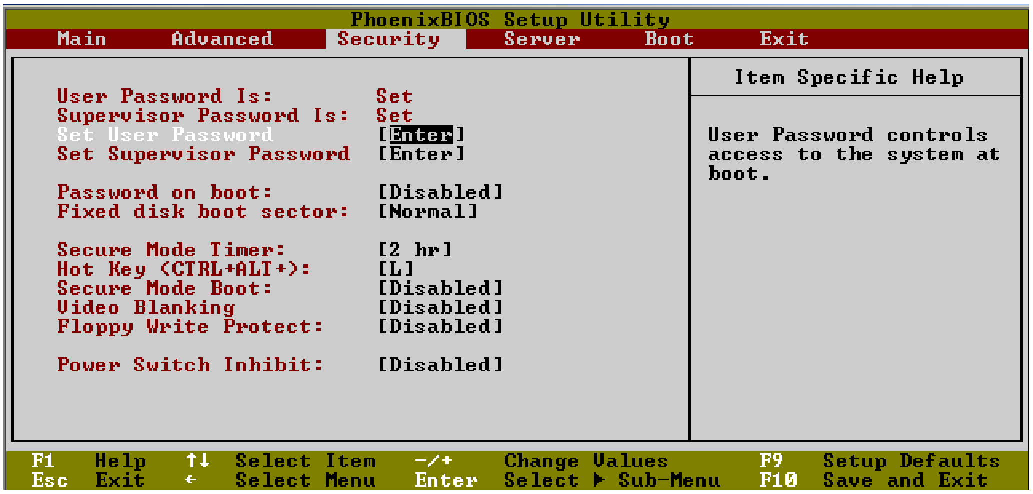
Enables Wake On LAN support.

F1 Help
↑↓ Select Item
-/+ Change Values
F9 Setup Defaults
Esc Exit
← Select Menu
Enter Select ▶ Sub-Menu
F10 Save and Exit

Parameter	Description	Option
Wake on LAN	Enables or disables the Wake on LAN function	**Disabled** Enabled
Wake on Ring	Enables or disables the Wake on Ring function	**Disabled** Enabled
Sleep Button	Enables or disables chassis support for separate power and sleep buttons	Absent **Present**

Security

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.



```
                         PhoenixBIOS Setup Utility
   Main       Advanced      Security      Server      Boot      Exit

     User Password Is:            Set                 Item Specific Help
     Supervisor Password Is:      Set
     Set User Password            [Enter]          User Password controls
     Set Supervisor Password      [Enter]          access to the system at
                                                   boot.
     Password on boot:            [Disabled]
     Fixed disk boot sector:      [Normal]

     Secure Mode Timer:           [2 hr]
     Hot Key (CTRL+ALT+):         [L]
     Secure Mode Boot:            [Disabled]
     Video Blanking               [Disabled]
     Floppy Write Protect:        [Disabled]

     Power Switch Inhibit:        [Disabled]

  F1   Help   ↑↓  Select Item    -/+    Change Values        F9   Setup Defaults
  Esc  Exit   ↔   Select Menu    Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

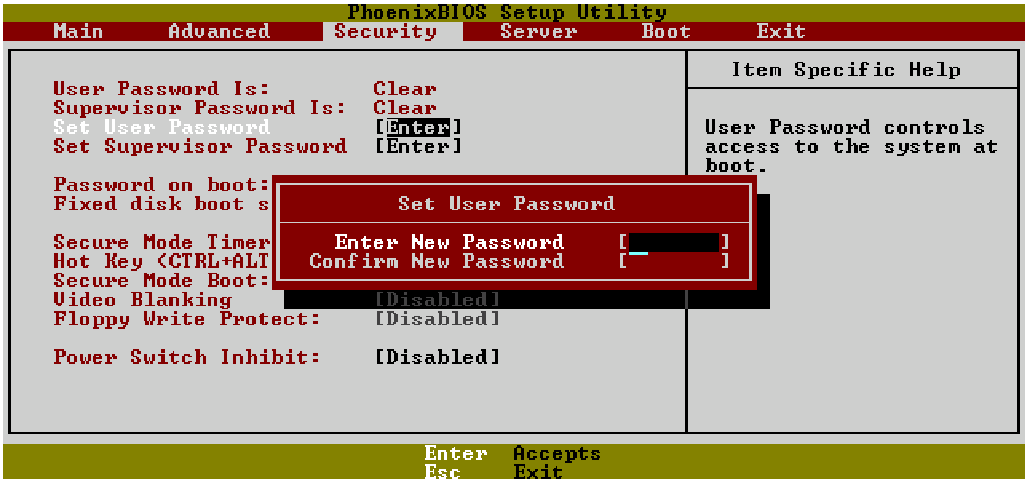
Parameter	Description	Option
User Password is	Secures your system against unauthorized use. Once you set this password, you have to type it whenever you boot the system. User password is available only when a Supervisor password is set.	Set Clear
Supervisor Password is	Prevents unauthorized access to the BIOS setup	Set Clear
Set User Password	Press **Enter** to set a User password.	
Set Supervisor Password	Press **Enter** to set a Supervisor password.	
Password on Boot	Enables or disables password entry during bootup	**Disabled** Enabled
Fixed Disk Boot Sector	Write-protects the hard disk's boot sector to prevent virus infection	**Normal** Write-protect

Parameter	Description	Option
Secure Mode Timer	Set a period of keyboard/mouse inactivity before Secure Mode is activated.	2 min 5 min 10 min 20 min 1 hr 2 hr
Hot Key (CTRL + ALT + _)	Select a key to be used in combination with (CTRL + ALT + _) to serve as a hot key in activating Secure Mode. Options include A- Z and 0 - 9. **Note:** Selected key combination should not conflict with a key combination used by a system application.	
Secure Mode Boot	Select whether or not to boot up in Secure Mode	**Disabled** Enabled
Video Blanking	Select whether or not to blank the monitor when Secure Mode is activated	**Disabled** Enabled
Floppy Write Protect	Select whether or not to write-protect the floppy drive when Secure Mode is activated	**Disabled** Enabled
Power Switch Inhibit	Enables or disables the power switch on the system's front panel. When this parameter is set to Enabled, the power switch is disabled.	**Disabled** Enabled

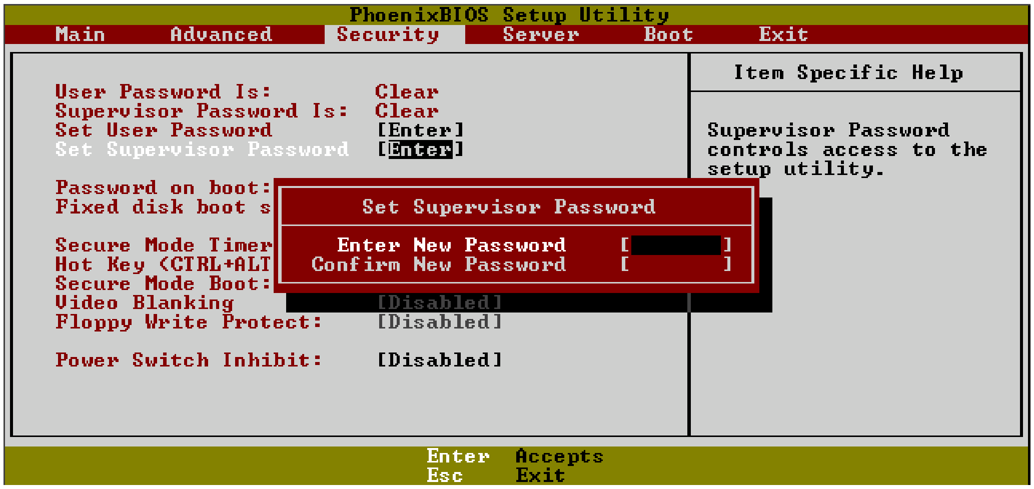
To set a security password

1 Use the up/down keys to highlight a set password parameter then press **Enter**.

A password box will appear.



```
                    PhoenixBIOS Setup Utility
  Main      Advanced      Security     Server     Boot     Exit

                                                 Item Specific Help
  User Password Is:            Clear
  Supervisor Password Is:      Clear
  Set User Password            [Enter]            User Password controls
  Set Supervisor Password      [Enter]            access to the system at
                                                  boot.
  Password on boot:
  Fixed disk boot s        Set User Password

  Secure Mode Timer      Enter New Password    [        ]
  Hot Key (CTRL+ALT     Confirm New Password   [        ]
  Secure Mode Boot:
  Video Blanking               [Disabled]
  Floppy Write Protect:        [Disabled]

  Power Switch Inhibit:        [Disabled]

                           Enter    Accepts
                           Esc      Exit
```



```
                    PhoenixBIOS Setup Utility
  Main      Advanced      Security     Server     Boot     Exit

                                                 Item Specific Help
  User Password Is:            Clear
  Supervisor Password Is:      Clear
  Set User Password            [Enter]            Supervisor Password
  Set Supervisor Password      [Enter]            controls access to the
                                                  setup utility.
  Password on boot:
  Fixed disk boot s      Set Supervisor Password

  Secure Mode Timer      Enter New Password    [        ]
  Hot Key (CTRL+ALT     Confirm New Password   [        ]
  Secure Mode Boot:
  Video Blanking               [Disabled]
  Floppy Write Protect:        [Disabled]

  Power Switch Inhibit:        [Disabled]

                           Enter    Accepts
                           Esc      Exit
```

2 Type a password.

The password may consist of up to six alphanumeric characters (A-Z, a-z, 0-9).

3 Retype the password to verify the first entry.

4 Press **Enter**.

After setting the password, the system automatically changes the chosen password parameter to Set.

To change the Supervisor/User password

1. Use the up/down keys to highlight either set password parameters then press **Enter**.
2. Type the original password then press **Enter**.
3. Type a new password then press **Enter**.
4. Retype the password to verify the first entry then press **Enter** again.

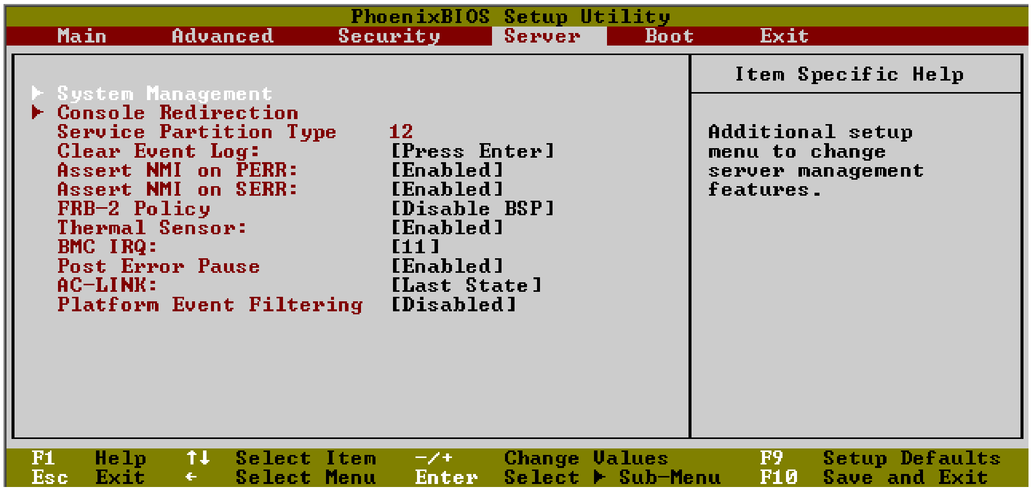
To remove the User/Supervisor password

1. Use the up/down keys to highlight either set password parameters then press **Enter**.
2. Enter the current password then press **Enter**.
3. Press **Enter** twice without entering anything in the new and confirm password fields.

After doing this, the system automatically sets the corresponding password parameter to Clear.

Server

The Server menu allows you to configure parameter settings related to server management.



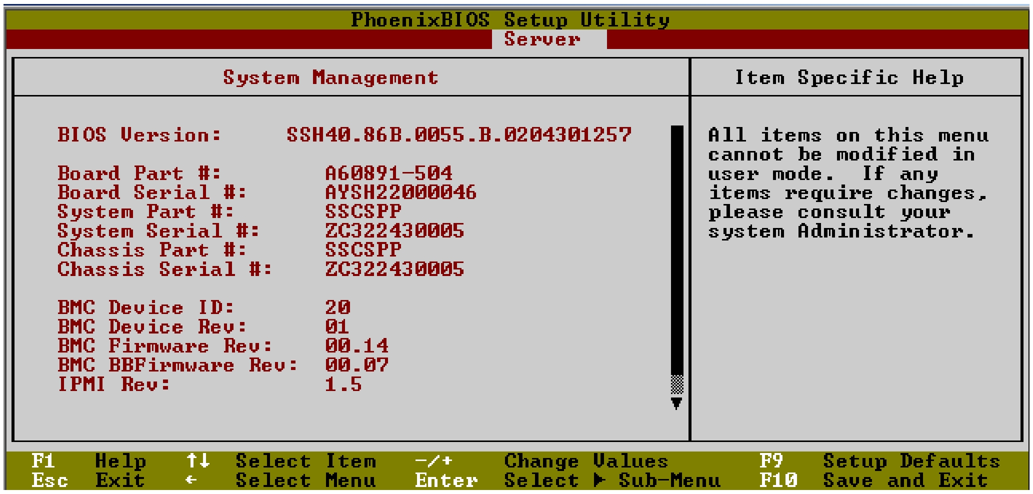
```
                        PhoenixBIOS Setup Utility
   Main      Advanced      Security      Server      Boot      Exit

 ▶ System Management                                 Item Specific Help
 ▶ Console Redirection
   Service Partition Type      12                  Additional setup
   Clear Event Log:            [Press Enter]       menu to change
   Assert NMI on PERR:         [Enabled]           server management
   Assert NMI on SERR:         [Enabled]           features.
   FRB-2 Policy                [Disable BSP]
   Thermal Sensor:             [Enabled]
   BMC IRQ:                    [11]
   Post Error Pause            [Enabled]
   AC-LINK:                    [Last State]
   Platform Event Filtering    [Disabled]

 F1   Help  ↑↓  Select Item   -/+    Change Values        F9    Setup Defaults
 Esc  Exit  ←   Select Menu   Enter  Select ▶ Sub-Menu    F10   Save and Exit
```

Parameter	Description	Option
System Management	Press **Enter** to access the System Management submenu.	
Console Redirection	Press **Enter** to access the Console Redirection submenu.	
Service Partition Type	Displays the current service partition type.	
Clear Event Log	Press **Enter** then select **Yes** from the prompt to clear the event log.	
Assert NMI on PERR	Enables or disables the PCI PERR support.	Disabled **Enabled**
Assert NMI on SERR	Enables or disables the PCI SERR support.	Disabled **Enabled**

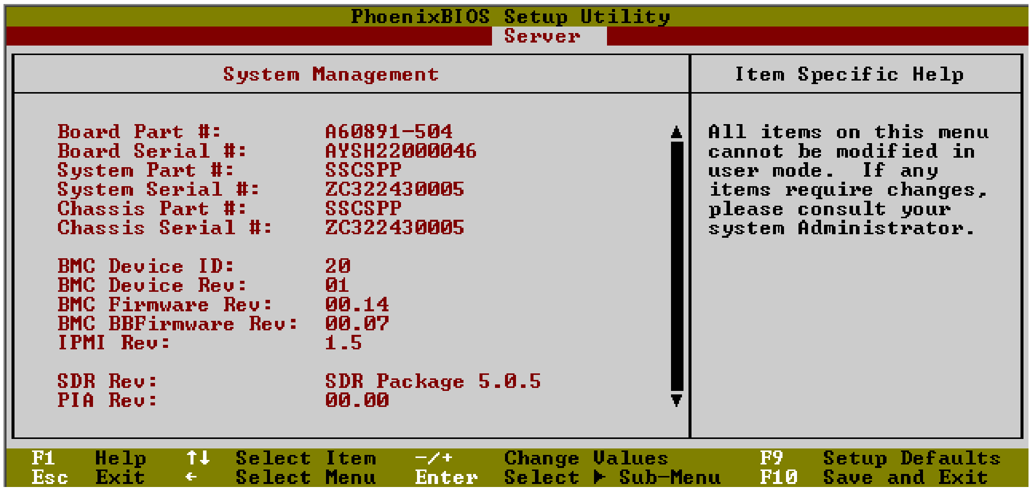
Parameter	Description	Option
FRB-2 Policy	Selects an action to implement when an FRB-2 failure occurs, that is whether to disable the BSP (Boot Strap Processor) or not. An FRB-2 failure occurs if the system fails to respond after six minutes of bootup attempt.	Disable FRB2 Timer **Disable BSP** Do not disable BSP Retry 3 times
Thermal Sensor	Specifies whether BIOS will disable boot when system temperature is outside the safe range.	Disabled **Enabled**
BMC IRQ	Specifies the routing address for the BMC interrupt.	Disabled 5 10 **11**
Post Error Pause	When enabled, if the POST finds an error, it will pause and the user has to press **F1** to continue. If disabled, even when the POST finds an error, it will not pause. This may result to reduced system functionality.	Disabled **Enabled**
AC-Link	Sets the AC-Link mode.	**Last State** Power on Stay off
Platform Event Filtering	Specifies whether to enable or disable the trigger elements for system sensor events.	Disabled **Enabled**

System Management

This submenu displays a list of information regarding the system hardware. All parameters are non-configurable in user mode.



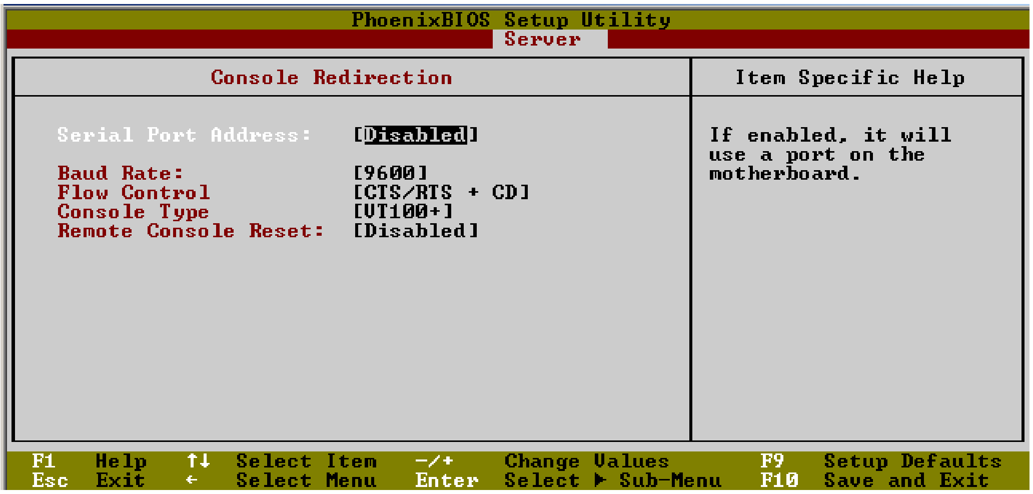
```
                         PhoenixBIOS Setup Utility
                                  Server
                System Management                     Item Specific Help

   BIOS Version:     SSH40.86B.0055.B.0204301257      All items on this menu
                                                      cannot be modified in
   Board Part #:        A60891-504                    user mode.  If any
   Board Serial #:      AYSH22000046                  items require changes,
   System Part #:       SSCSPP                        please consult your
   System Serial #:     ZC322430005                   system Administrator.
   Chassis Part #:      SSCSPP
   Chassis Serial #:    ZC322430005

   BMC Device ID:       20
   BMC Device Rev:      01
   BMC Firmware Rev:    00.14
   BMC BBFirmware Rev:  00.07
   IPMI Rev:            1.5

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▶ Sub-Menu    F10  Save and Exit
```



```
                         PhoenixBIOS Setup Utility
                                  Server
                System Management                     Item Specific Help

   Board Part #:        A60891-504                    All items on this menu
   Board Serial #:      AYSH22000046                  cannot be modified in
   System Part #:       SSCSPP                        user mode.  If any
   System Serial #:     ZC322430005                   items require changes,
   Chassis Part #:      SSCSPP                        please consult your
   Chassis Serial #:    ZC322430005                   system Administrator.

   BMC Device ID:       20
   BMC Device Rev:      01
   BMC Firmware Rev:    00.14
   BMC BBFirmware Rev:  00.07
   IPMI Rev:            1.5

   SDR Rev:             SDR Package 5.0.5
   PIA Rev:             00.00

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Console Redirection

This submenu lets you specify the settings for connecting to the RDM Manager station.

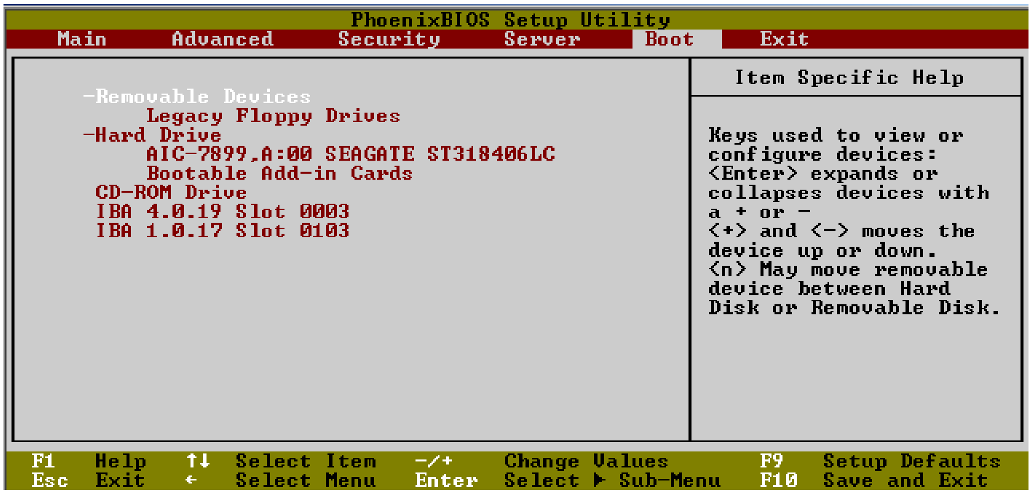


```
                         PhoenixBIOS Setup Utility
                                  Server
              Console Redirection               Item Specific Help

   Serial Port Address:      [Disabled]       If enabled, it will
                                              use a port on the
   Baud Rate:                [9600]           motherboard.
   Flow Control              [CTS/RTS + CD]
   Console Type              [VT100+]
   Remote Console Reset:     [Disabled]

 F1   Help  ↑↓  Select Item  -/+    Change Values          F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▶ Sub-Menu      F10  Save and Exit
```

Parameter	Description	Option
Serial Port Address	Selects the serial port to be used for connecting to the RDM Manager.	**Disabled** Onboard COM A Onboard COM B
Baud Rate	This parameter lets you set the RDM connection transfer rate. This parameter setting depends on your modem specification; therefore, before you change the setting of this parameter, check the documentation that came with your modem.	**9600** 19.2 K 38.4 K 57.6 K 115.2 K
Flow Control	Selects whether to enable the flow control function	None XON/XOFF CTS/RTS **CTS/RTS + CD**
Console Type	Selects the RDM console type	PC ANSI **VT100+** VT-UTF8
Remote Console Reset	Selects whether or not to enable the remote console reset function	**Disabled** Enabled

Boot

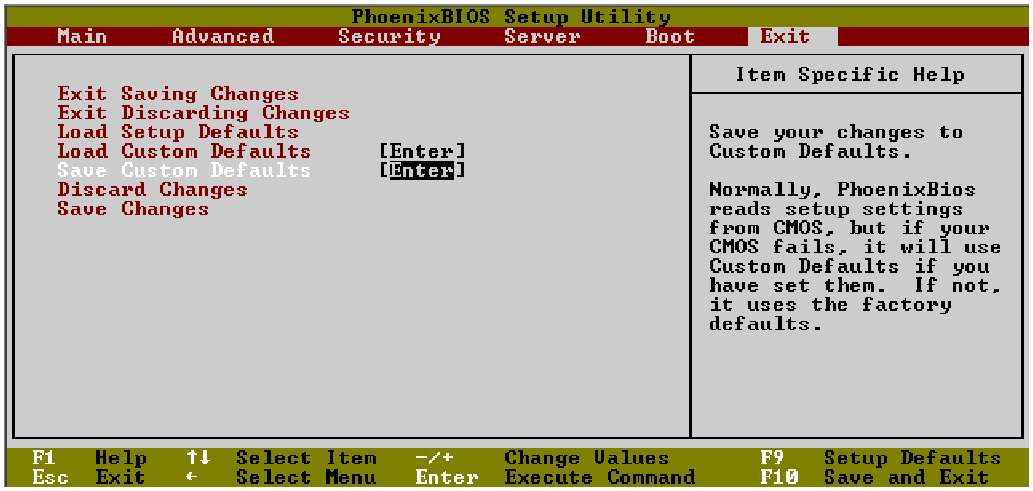
The Boot menu displays a list of removable device(s) and hard disk(s) available in the system.



```
                        PhoenixBIOS Setup Utility
   Main      Advanced      Security      Server      Boot      Exit

     -Removable Devices                                  Item Specific Help
          Legacy Floppy Drives
     -Hard Drive                                       Keys used to view or
          AIC-7899,A:00 SEAGATE ST318406LC             configure devices:
          Bootable Add-in Cards                        <Enter> expands or
      CD-ROM Drive                                     collapses devices with
      IBA 4.0.19 Slot 0003                             a + or -
      IBA 1.0.17 Slot 0103                             <+> and <-> moves the
                                                       device up or down.
                                                       <n> May move removable
                                                       device between Hard
                                                       Disk or Removable Disk.

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu    F10  Save and Exit
```

Exit

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.



```
                        PhoenixBIOS Setup Utility
   Main      Advanced     Security     Server     Boot      Exit

    Exit Saving Changes                          Item Specific Help
    Exit Discarding Changes
    Load Setup Defaults                        Save your changes to
    Load Custom Defaults       [Enter]         Custom Defaults.
    Save Custom Defaults       [Enter]
    Discard Changes                            Normally, PhoenixBios
    Save Changes                               reads setup settings
                                               from CMOS, but if your
                                               CMOS fails, it will use
                                               Custom Defaults if you
                                               have set them.  If not,
                                               it uses the factory
                                               defaults.

  F1   Help  ↑↓  Select Item   -/+    Change Values        F9   Setup Defaults
  Esc  Exit  ←   Select Menu   Enter  Execute Command      F10  Save and Exit
```

Parameter	Description
Exit Saving Changes	Saves changes made and close the BIOS setup.
Exit Discarding Changes	Discards changes made and close the BIOS setup.
Load Setup Defaults	Loads the factory-default settings for all BIOS setup parameters.
Load Custom Defaults	Loads the user-default settings for all BIOS parameters. When system CMOS fails, BIOS will use this customized set of parameter settings; otherwise the factory-default settings will be used. **Note**: This parameter is only available when you have saved a set of parameter settings as Custom Defaults.
Save Custom Defaults	Saves currents settings as Custom Defaults.
Discard Changes	Discards all changes made to the BIOS setup and loads previous configuration settings.
Save Changes	Saves all changes made to the BIOS setup.

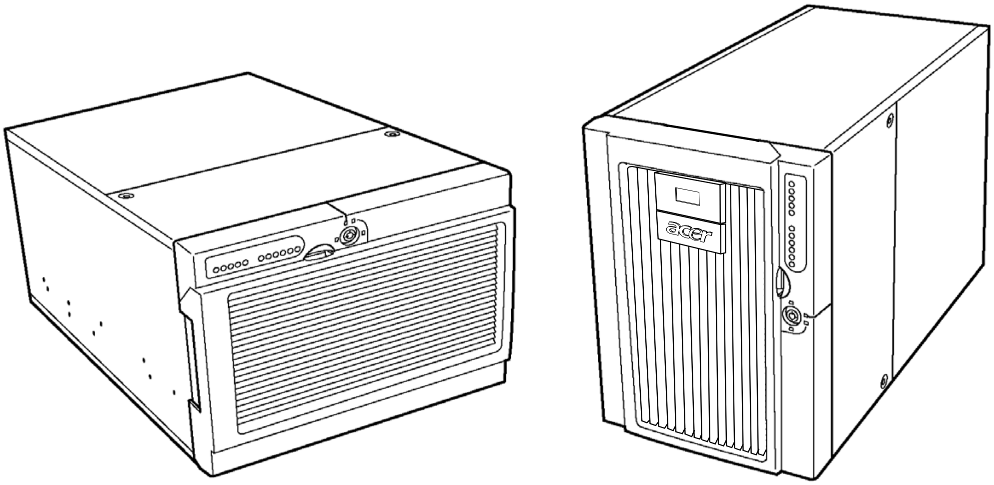
Appendix A: System rack installation

This appendix describes the procedures for configuring the system in a rack-mount fashion.

System rack installation

The Altos G900 server system is available in both rack-mount and tower configuration. A rack mount kit is available for customers who want to convert a tower-mounted system to rack-model design. To purchase a rack mount kit, contact your local Acer representative or order directly from www.acer.com.tw.

The figure below shows the Altos G900 server in a rack-mount and tower position.



Rack-mount position

Tower position

Figure 58 - Server orientation

Important: When installing or removing the server from the rack, use an appropriate mechanical assist unit to lift and move the server.

Rack-mount kit contents

The rack conversion kit for the Altos G900 server platform contains the following items:

- Rack bezel and keys
- Rack handle kit (handles and screws)

- Bag of mounting hardware (bushings and screws)

You must also purchase the rack-mount rail kit for the Altos G900 server platform to complete the conversion from tower to a rack-mount configuration.

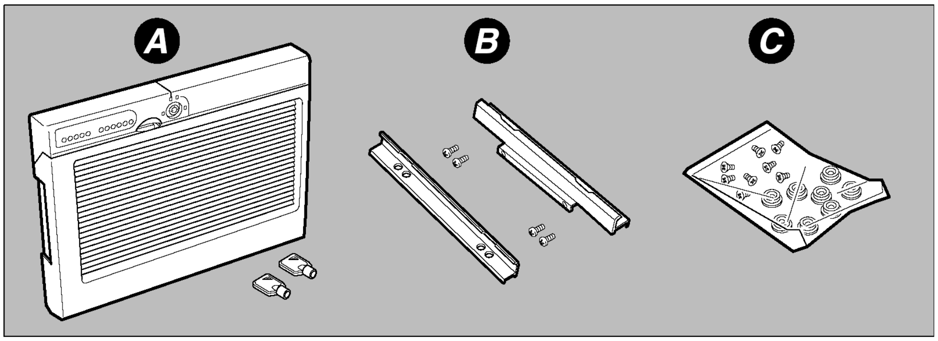


Figure 59 - Rack-mount kit components

a Rack bezel and keys (2)
b Rack handle kit - includes handles (2) and screws (4)
c Bag of mounting hardware - includes bushings (8) and screws (8)

Tools and supplies needed

You will need the following tools and supplies to install the contents of this kit:

- Phillips (cross-head) screwdriver (#2 bit)
- Antistatic wrist strap (recommended)

Note: The Altos G900 chassis is designed to be compatible with the EIA-310-d rack standard. Be sure to select a rack cabinet enclosure that is EIA-310-d compliant.

Equipment rack precautions

Warnings

ANCHOR THE EQUIPMENT RACK: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 pounds). You must also consider the weight of any other device installed in the rack.

MAIN AC POWER DISCONNECT: You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as a controlling power to the entire unit, not just to the server(s).

GROUNDING THE RACK INSTALLATION: To avoid the potential for an electrical shock hazard, you must include a third wire safety grounding conductor with the rack installation. If server power cords are plugged into AC outlets that are part of the rack, then you must provide proper grounding for the rack itself. If server power cords are plugged into wall AC outlets, the safety grounding conductor in each power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

OVERCURRENT PROTECTION: The server is designed for an AC line voltage source with up to 20 amperes of overcurrent protection. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server.

Precautions

Temperature: The operating temperature of the server, when installed in an equipment rack, must not go below 5°C (41°F) or rise above 35°C (95°F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. Depending on the configuration of the server, it must also include ventilation sufficient to exhaust between 1750 Btu and 3000 Btu per hour. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

Rack conversion procedures

This section describes the procedures to install the contents of the rack conversion kit. Unless otherwise specified, all references to chassis directions (top, bottom, left, right, front, and rear) refer to a chassis in rack orientation when you are facing the front of the chassis.

Be sure to observe the safety and ESD precautions in the “Installation precautions” on page 41.

Installation overview

Installing the contents of the rack conversion kit involves the following steps:

- Removing the bottom panel
- Removing the left panel
- Removing the original tower bezel
- Removing the feet
- Installing the rack bezel
- Installing the bushings on the chassis
- Installing the handles and rails (see the note below)

Note: You also need the manual from the rack-mount rail kit to complete this installation.

The following sections describe the above procedures in detail.

Removing the bottom panel

1 Orient the server so it is resting on its feet as shown in Figure 60.

2 Remove the two screws (Figure 60, A) located on the rear edge of the bottom panel.

3 Slide the panel toward the rear of the chassis (Figure 60, B).

4 Using the orientation shown in Figure 60 as a reference, grasp the bottom edge of the cover (Figure 60, C) and tilt it out. Then lift the cover straight up (Figure 60, D) to free it from the tabs on the chassis.

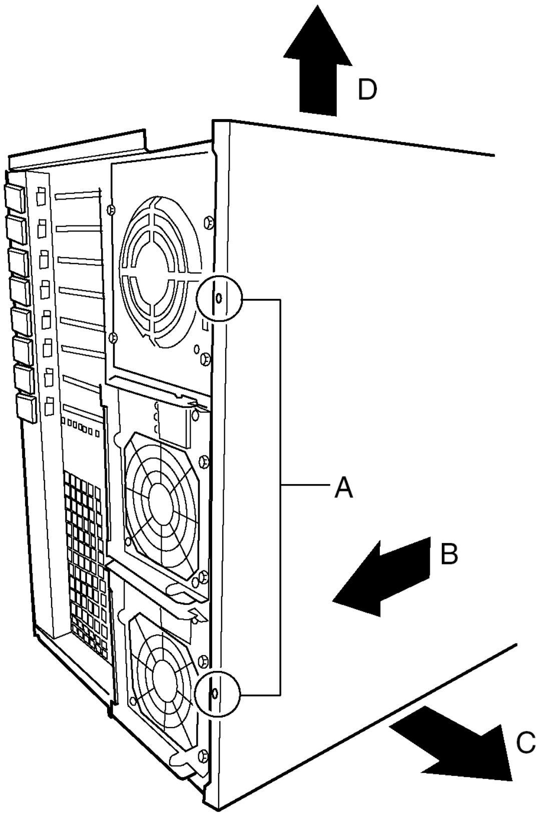


Figure 60 - Removing the bottom panel

Removing the left panel

1 Loosen the screw (Figure 61, A) on the rear edge of the left panel.

2 Slide the cover toward the rear of the chassis (Figure 61, B) and lift it off.

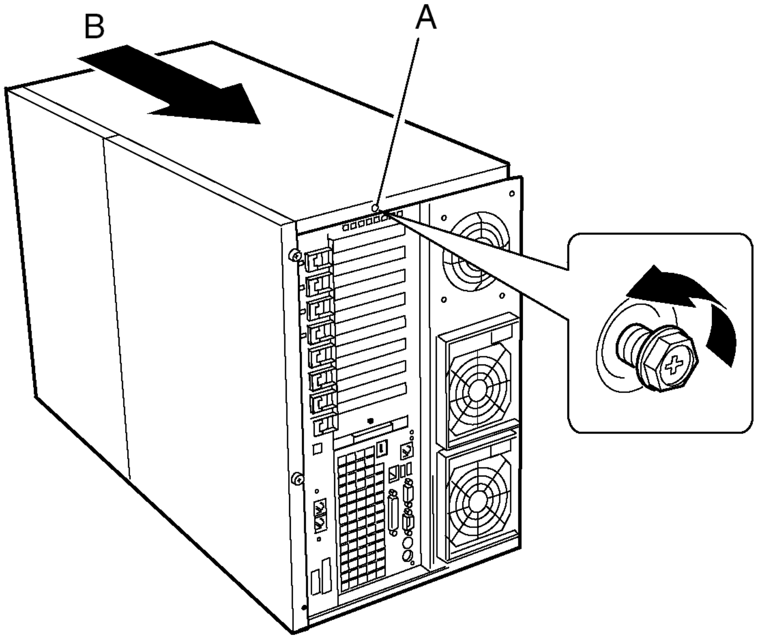


Figure 61 - Removing the left panel

Removing the original tower bezel

You must remove the bezel that originally came with the tower configuration of the Altos G900 server platform and, later in the installation, replace it with the bezel from the rack conversion kit.

1. Move the chassis so the door hangs over the edge of your workbench.
2. Open the door.
3. Ensure that the bezel lock is in the fully unlocked position. You cannot remove the bezel unless it is unlocked.
4. Press on each of the eight plastic tabs (Figure 62, A) on the frame of the bezel until all the tabs are free of their slots and then lift the bezel off the chassis.

   In the view shown below, there are three tabs on the left wall of the frame, two on the top, two on the right, and one on the bottom.
5. Secure the keys for the tower bezel.

   It is recommended that the keys be taped to the inside of the tower bezel for future use.

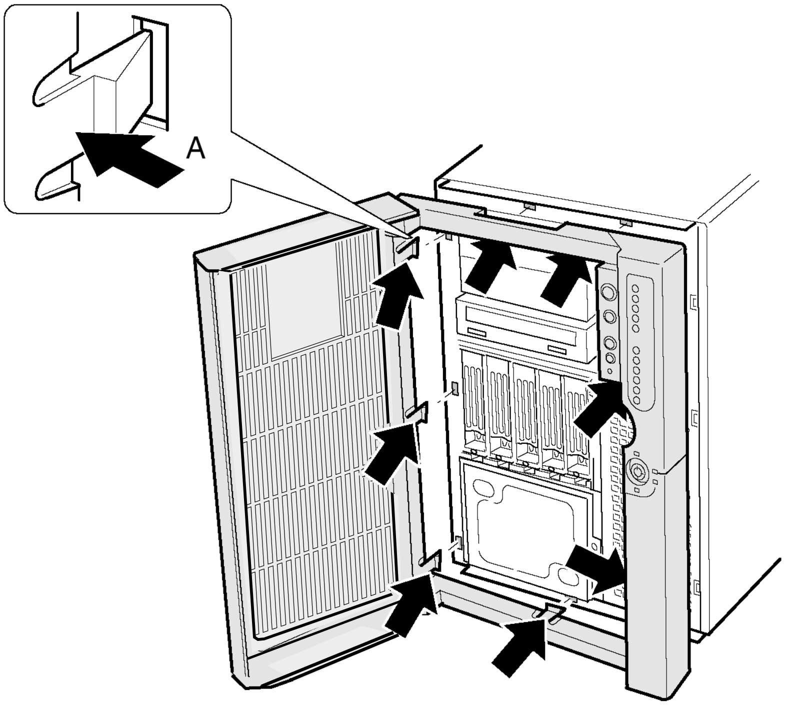


Figure 62 - Removing the original tower bezel

Note: Do not throw away the keys from the original tower bezel. The keys and lock on each bezel are paired together and will not work with a different bezel. The lockset and the keys both have a stamped number on them, and these numbers must match for the keys to work.

Removing the feet

1 Place the chassis on a workbench so it is lying on its bottom and the feet (Figure 63, A) are on the right.

2 Remove the screw (Figure 63, B) that holds the front foot to the chassis, slide the foot upward, then remove the foot.

3 Remove the screw (Figure 63, B) that holds the rear foot to the chassis, slide the foot upward, then remove the foot.

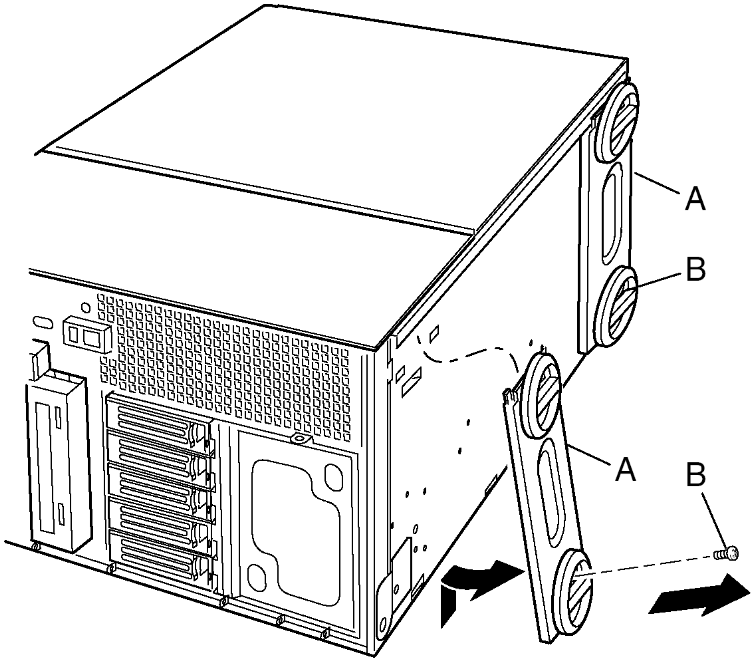


Figure 63 - Removing the feet

Note: If the rack system will ever be converted back to a tower configuration, be sure to keep all unused tower parts—the tower bezel, keys, bottom and left panels, feet, and two screws—for future use.

Installing the rack bezel

1 Remove the rack bezel keys that are taped to the inside of the rack bezel and secure them for future use. At a minimum, attach them to the plastic key clip located on the rear panel of the system so they do not get lost.

2 Open the door on the rack bezel from the rack conversion kit.

3 Align the eight tabs on the rack bezel with the eight slots on the front of the chassis.

4 Insert each tab in the corresponding slot and push the bezel against the front of the chassis until it is fully seated.

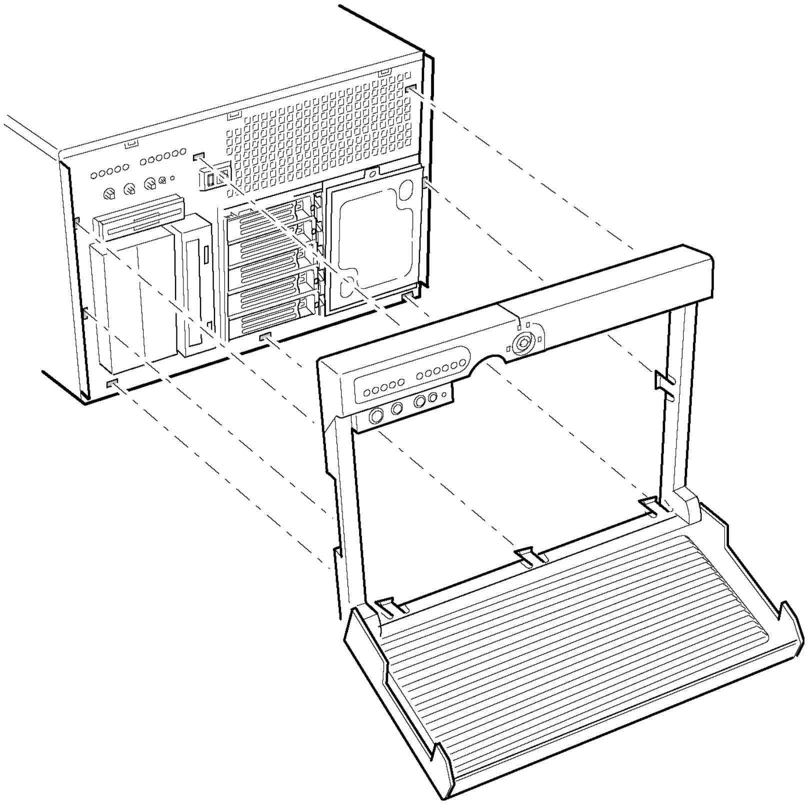


Figure 64 - Installing the rack bezel

Installing the bushings on the chassis

You need six bushings and screws to install the rack rails on the system, three per side. The two extra bushings and screws are for use as spares.

1 Insert a screw (Figure 65, A) in one of the bushings (Figure 65, B), and then insert it in a mounting hole (Figure 65, C) on the right frame wall of the chassis (Figure 65, D). Tighten the screw.

2 Repeat step 1 for the remaining mounting holes on the right frame wall (Figure 65, D), using the pattern indicated in Figure 65.

3 Attach the three bushings on the left frame wall of the chassis (Figure 65, E) in the pattern shown in Figure 65 using the same procedure described in step 1.

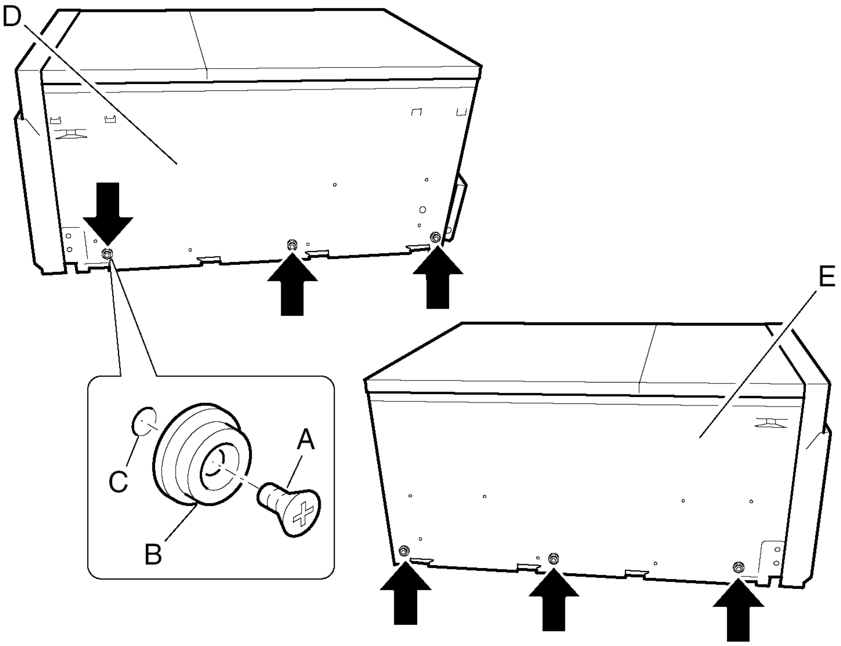


Figure 65 - Installing the bushings

Installing the handles and rails

To complete the installation the rack conversion kit contents, you must also have the rack-mount rail kit.

WARNING! To avoid personal injury when handling the server, use a hand-truck or other mechanical assist unit to move the server from one location to another. Do not attempt to lift or move the server by the handles on the power supplies.

Refer to the installation guide that came with the rack-mount rail kit for detailed instructions on installing the handles and rails, as well as mounting the server in the rack.

1 Extend the inner rail out of the rail assembly until the component rail release latch clicks. Hold down the latch and slide out the inner rail out of the rail assembly. Do the same thing to the other assembly rail.

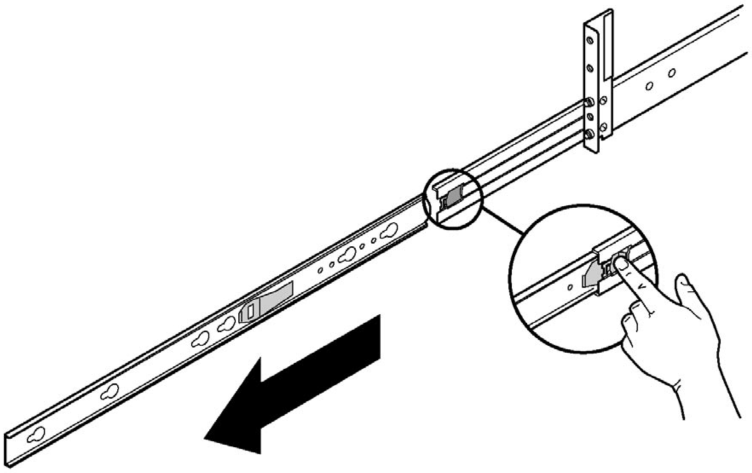


Figure 66 - Sliding out the inner rails

2 Install the outer rails to the rack.

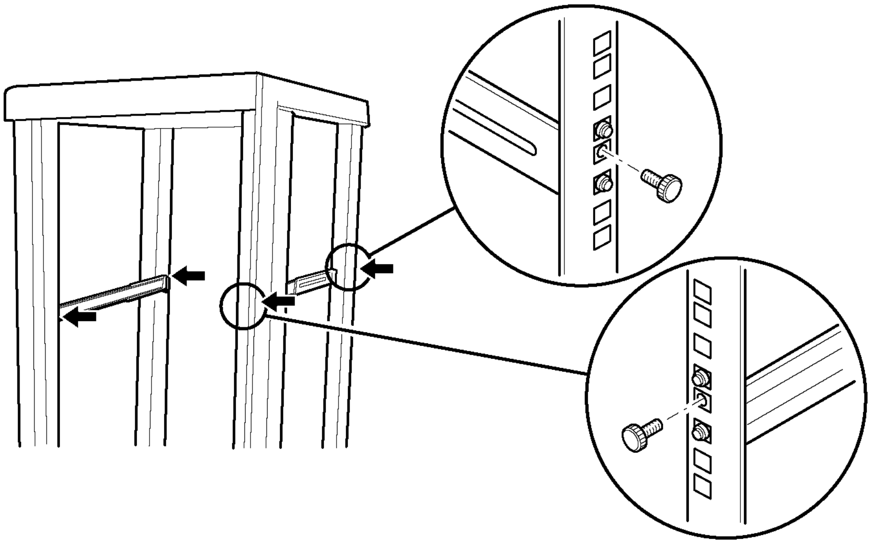


Figure 67 - Installing the outer rails to the rack

3 Attach the inner rails to the server.

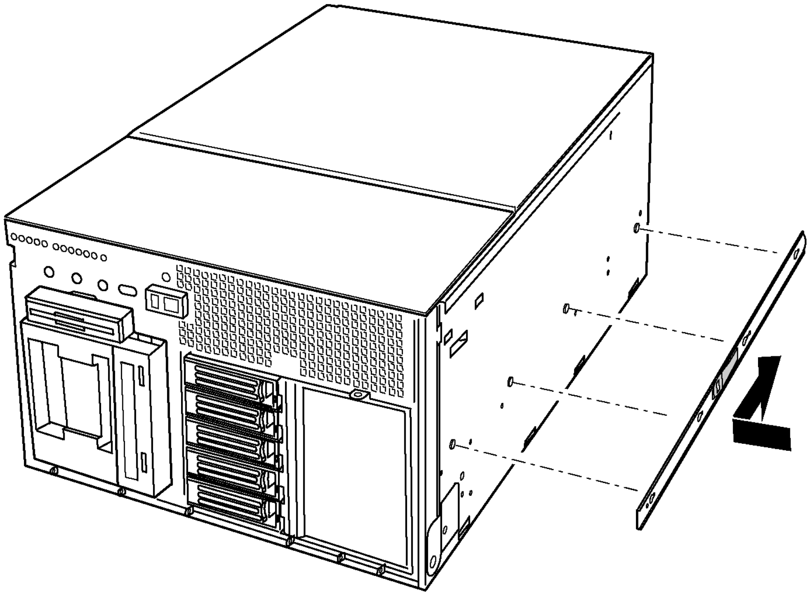


Figure 68 - Installing the inner rails to the server

4 Attach the rack handles to the server.

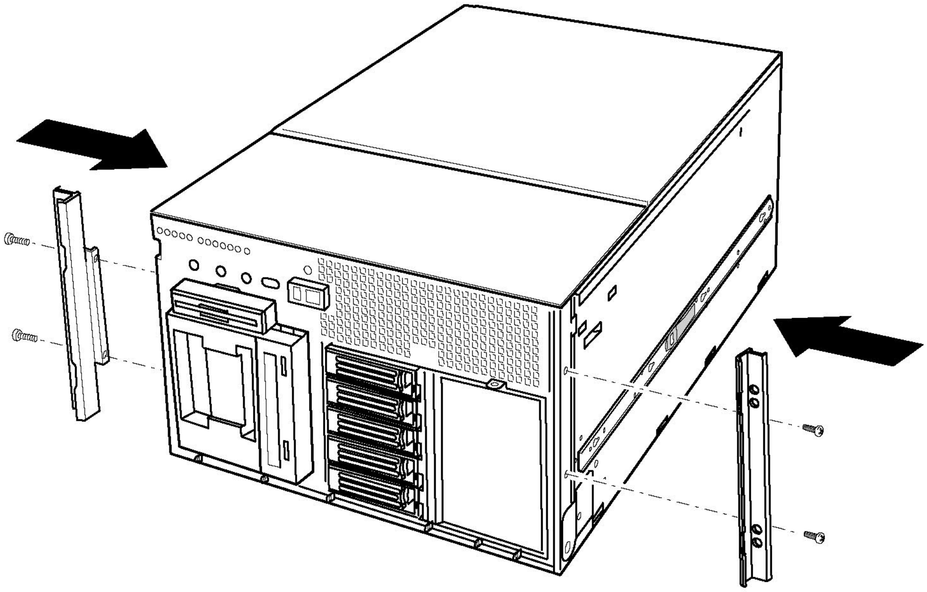


Figure 69 - Installing the rack handle to the server

5 Slide the server into the rack.

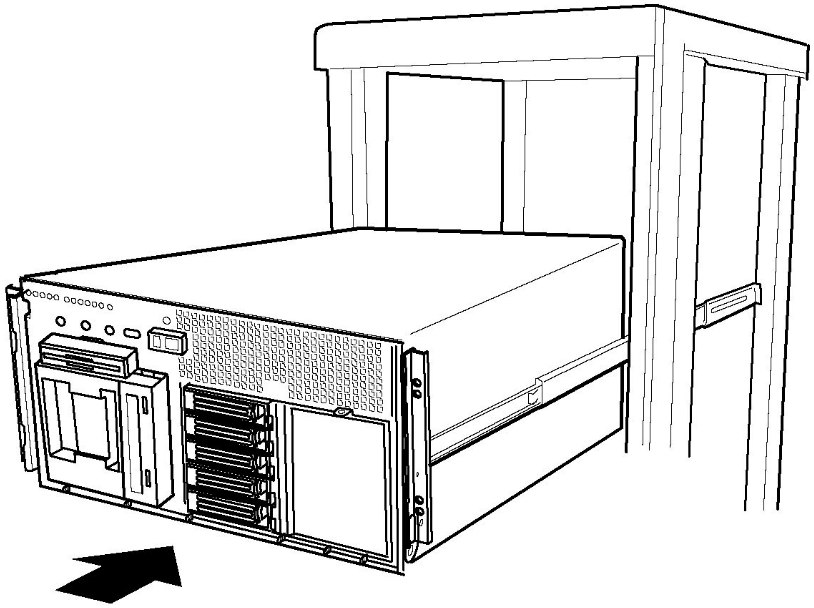


Figure 70 - Mounting the server to the rack

Appendix B: System management

This appendix gives information about the software programs and utilities bundled with your system.

Software and utilities

Your system came bundled with several software programs and utilities designed to streamline your server's operations. These utilities may include any of the following:

- BIOS setup

  For modifying server board set features, including setting time, date, and system passwords; setting the boot device priority; configuring the diskette drive and serial ports; and enabling the SCSI BIOS and system management features.

- SCSI*Select*

  For configuring the onboard SCSI host adapter, including changing default values, checking and changing SCSI device settings that may conflict with those of other devices in the server, and performing a low-level format on SCSI devices installed in the server.

- BIOS and firmware updates

  For updating the BIOS on the system board and other system firmware.

Additional utilities for system management are described on page 145.

Integrated hardware system management

The figure below is a simplified diagram of the system management features integrated into the server.

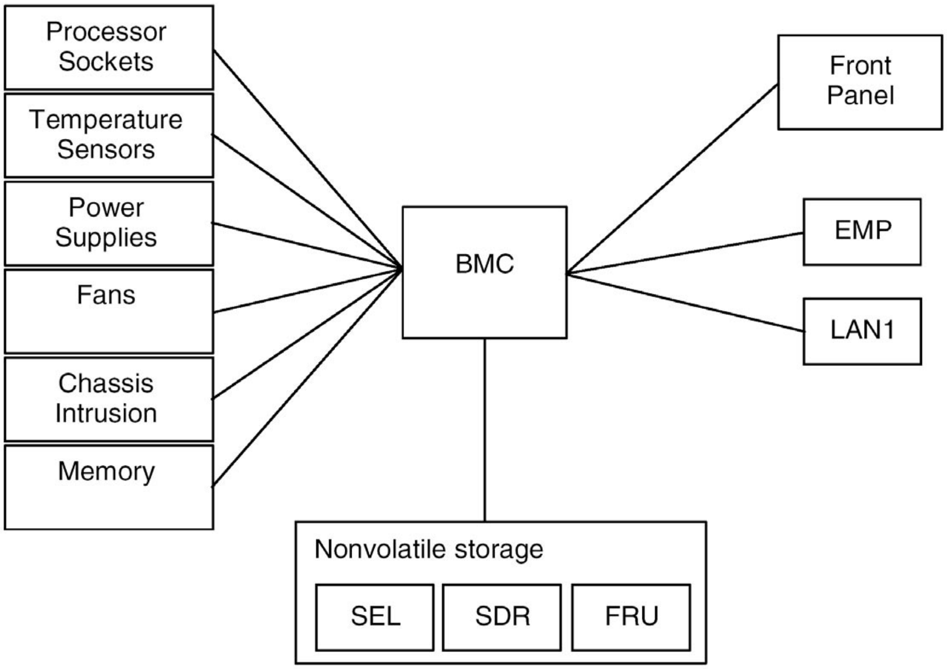

Processor Sockets
Temperature Sensors
Power Supplies
Fans
Chassis Intrusion
Memory
BMC
Front Panel
EMP
LAN1
Nonvolatile storage
SEL
SDR
FRU

Figure 71 - Integrated system management

Baseboard management controller

The Altos G900 system incorporates a baseboard management controller (BMC), which is a dedicated microcontroller for system management activities. The BMC performs the following functions:

- Monitors system components and sensors, including processors, memory, fans, power supplies, temperature sensors, and chassis intrusion sensors.
- Manages nonvolatile storage for the system event log (SEL), sensor data records (SDRs), and baseboard field-replaceable unit (FRU) inventory.
- Interfaces with the emergency management port (EMP) and LAN1 port to send alerts and interact with remote management systems.

- Provides the main front panel control functions (power on/off, reset, and so on).

Field replaceable units and sensor data records

Field replaceable units (FRUs) are major modules in the chassis that contain active electronic circuitry. FRUs can store information such as board serial number, part number, name, and asset tag that can be read using the System Setup Utility (refer to page 168). The BMC stores FRU information for the mainboard in a nonvolatile storage component on the board.

The BMC uses Sensor Data Records (SDRs) to identify the sensors in the system for monitoring. SDRs provide a list of the sensors, their characteristics, location, type, and type-specific information, such as default threshold values, factors for converting a sensor reading into the appropriate units (mV, rpm, degrees Celsius), and information on the types of events that a sensor can generate. The BMC stores SDR information in a nonvolatile storage component on the mainboard.

You can use the FRU/SDR load utility (refer to page 185) to initialize or update the FRU and SDR information. Some machines are shipped from the factory with some sensors disabled, because the actual configuration of the chassis is only determined when the user completes the system configuration. Chassis-specific information in the FRU, such as chassis part number, is also absent. For these reasons, it is important to run the FRU/SDR load utility as part of the system setup process. You should also run the FRU/SDR load utility whenever you change the number of fans, processors, or power supplies in the server.

System event log

The BMC manages a system event log (SEL), where it records significant or critical system events. Such events include instances of out of range temperatures and voltages, fan failures, and other sensor-related events. The BIOS, software, add-in cards, and other devices can also log events by sending messages to the BMC. The SEL is stored in a nonvolatile storage.

You can view the current contents of the SEL by using the System Setup Utility (refer to page 168).

Platform event management

Events can trigger alerts and other actions by the BMC. The server is configured with the following set of standard events:

- Temperature sensor out of range
- Voltage sensor out of range
- Fan failure
- Chassis intrusion
- Power supply fault
- BIOS uncorrectable ECC error
- BIOS POST error
- Processor fault resilient booting (FRB) failure
- Fatal nonmaskable interrupt (NMI) from a source other than the front panel switch
- Watchdog timer reset, power down, or power cycle
- System restart (reboot)

Alerts can take either of these forms:

- Platform event pages

  The BMC dials a paging service and sends a predefined paging string. To use platform event paging (PEP), you must attach an external modem to the emergency management port (COM2).

- BMC LAN alerts

  The BMC sends an alert to a predefined destination on the LAN.

You can configure PEP and BMC LAN alerts by using the System Setup Utility (refer to page 168).

Emergency management port

The emergency management port (EMP) refers to the use of the COM2 port, with either an external modem or direct serial connection, for remote management. The BMC controls the port and interfaces with remote access software, such as the Direct Platform Control application in ASMe.

Note: For more information, refer to the ASMe User’s guide.

You can configure the EMP by using the System Setup Utility (refer to page 168).

System Setup Utility

The System Setup Utility (SSU) program is located on the System CD.

Run the System Setup Utility to:

- Set boot device priority
- Set passwords and security options
- View system events
- View FRU information
- View sensor data records
- Update system firmware and BIOS
- Save and restore the system configuration
- Set up the server to send alerts for platform events
- Set up the server for remote management

Using either the System Setup Utility or the BIOS setup (refer to page 113), you can specify the boot device sequence and set up system passwords and security options. Both utilities access the same stored configuration data for these items, and the result of making a change to these settings using either utility is identical.

The SSU consists of a collection of task-oriented modules plugged into a common framework called the Application Framework (AF). The Application Framework provides a launching point for individual tasks and a location for setting customization information.

Creating SSU diskettes

You can run the SSU directly from the Utilities menu of the System CD, from a set of DOS diskettes, or from the service partition of the hard disk.

If you choose to run the SSU from a set of DOS diskettes, you must create the SSU diskettes from the System CD as follows:

1. Boot to the System CD.
2. Choose *Create Diskettes* > *Create Diskettes by Device/Function* > *System Setup Utility*.
3. Follow the instructions displayed.

Alternatively, if you have a workstation with the Microsoft Windows operating system, you can insert the CD into that system and create the diskettes on that system.

Running the SSU

When the SSU starts in the default local execution mode, it accepts input from the keyboard or mouse. The SSU presents a VGA-based GUI (graphical user interface) on the primary monitor.

If you run the SSU from a read-only media, such as a CD-ROM, you cannot save user preference settings (such as screen colors).

The SSU supports ROM-DOS version 6.22. The SSU will not operate from a "DOS box" running under an operating system such as Windows.

To start the SSU

1 Start the SSU using one of the following methods:

- From diskettes

  Insert the first SSU diskette in floppy drive. Boot the server from the diskette. You are prompted to insert the second diskette. After loading completes the SSU starts automatically.

- From the Management CD

  Boot the server to the Management CD and start the SSU from the Utilities menu.

- From the service partition

  Boot the server to the service partition (page 34) and execute the following DOS commands:

```
C:\>  cd ssu

C:\SSU>  ssu.bat
```

2 The mouse driver loads if it is available; press **Enter** to continue.

3 When the SSU title appears on the screen, press **Enter** to continue.

Working with the GUI

You can access features of the GUI using the mouse or keyboard:

- Mouse
    - Click once to choose menu items and buttons or to select items in a list, such as the Available Tasks list.
    - To run a list item, such as one of from the Available Tasks list, select the item and click **OK** or double-click the item.
- Keyboard
    - Use the tab and arrow keys to highlight buttons
    - Press the spacebar or **Enter** to execute.
    - You can also execute a menu or button by using the **Alt** key in combination with the underlined letter in the name of the menu or button.

You can have more than one task open at the same time, although some tasks might require complete control to avoid possible conflicts. The tasks achieve complete control by keeping the task as the center of operation until you close the task window.

The SSU has a built-in help system, which you can access by clicking a Help button or choosing the Help menu.

Customizing the SSU interface

The SSU lets you customize your interface using the Preferences section of the Main window. The AF sets these preferences and saves them in the AF.INI file so that they take effect the next time you start the SSU. There are four user customizable settings:

• Color	Lets you change the default colors associated with different items on the screen using predefined color combinations. The color changes take effect immediately.

• Mode	Lets you set the desired expertise level: novice, intermediate, or expert. The expertise level determines which tasks are visible in the Available Tasks section and which actions each task performs. For a new mode setting to take effect, you must exit the SSU and restart it.
• Language	Lets you change the text in the SSU interface to the appropriate language. For a new language setting to take effect, you must exit from the SSU, then restart it.
• Other	Lets you show or hide the status bar at the bottom of the SSU Main window. The change takes effect immediately.

Note: If you run the SSU from a read-only media (CD-ROM, for example), these preferences are lost when you exit from the SSU.

Setting boot device priority

To change the boot priority of a device:

1 From the SSU Main window, choose **Boot Devices**.

2 In the Multiboot Options Add-in window, select a device.

3 Click the Move Up button to move it up in the list. Click the Move Down button to move it down

Setting passwords and security options

You can set a user password and an admin password. On some systems, you must set an admin password before you can set a user password. On other systems, the passwords are independent. You can set the same passwords and security options by using BIOS setup (refer to page 113).

Setting the admin password

The Admin Password button lets you set or change the admin password used by both the SSU and the system BIOS. This option is not available if both an admin and a user password are set and you entered only the user password when you started the SSU. All changes to the admin password take effect immediately.

To change or clear the administrator password:

1. From the SSU Main window, choose **Security**.
2. Click the Admin Password button.
3. If you are changing passwords, enter the old password.
4. Enter the new password (or leave blank to clear).
5. Confirm the password by entering it again (or leave blank to clear).
6. Click **OK** to save the password and return to the Security window.

Setting the user password

The User Password button lets you set or change the user password used by both the SSU and the system BIOS. All changes to the user password take effect immediately.

To change or clear the user password:

1. From the SSU Main window, choose **Security**.
2. Click the User Password button.
3. If you are changing passwords, enter the old password in the first box.
4. Enter the new password (or leave blank to clear).
5. Confirm the password by entering it again (or leave blank to clear).
6. Click **OK** to save the password and return to the Security window.

Setting security options

1. In the Security window, click the Options button.
2. For each option, select the desired setting from the list. The options are:

Option	Description
Security Hot Key	The key combination that can be used to put the server into secure mode.
Secure Mode Timer	If no keyboard or mouse activity occurs during the chosen time interval, the server enters secure mode.
Secure Mode Boot	The Enable option forces the server to boot directly into secure mode.
Video Blanking	The Enable option turns off the video when the server is in secure mode
Floppy Write	The Enable option prevents writing to the diskette drive while the server is in secure mode.
Power Switch Inhibit	The Enable option prevents the power and reset buttons from functioning when the server is in secure mode. The Disable option allows the power and reset buttons to function normally when the server is in secure mode

3. Click **Save** to save the settings and return to the Security window.

Viewing the system event log

To view the System Event Log (SEL):

1. From the SSU Main window, choose **SEL Manager**.

   When you start the SEL Manager, it automatically loads the current list of events from nonvolatile memory.
2. Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all the columns.

3 Use the File and SEL menu items to work with the SEL information:

• Open	Views data from a previously saved SEL file.
• Save As	Saves the currently loaded SEL data to a file.
• Properties	Displays information about the SEL.
• Clear SEL	Clears the SEL data from the nonvolatile storage area.
• Reload	Refreshes the display by reading the current SEL entries from the server.
• Sort By	Sorts the displayed events by event number, time stamp, sensor type and number, event description, or event generator ID.

Viewing FRU information

To view the Field Replaceable Unit (FRU) information:

1 From the SSU Main window, choose **FRU Manager**.

When you start the FRU Manager, it automatically loads the current list of events from nonvolatile memory.

The FRU Manager window has a navigation pane on the left that displays, in a tree format, the inventory of components in the server. The tree has three categories: Chassis, Board, and Product. Clicking on a category expands or collapses a list of components for that category. Clicking on an individual component displays the FRU information for that component in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected FRU area.

2 Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all the columns.

3 Use the File and FRU menu items to work with the FRU information:

• Open	Views data from a previously saved FRU file.
• Save As	Saves the currently loaded FRU data to a file.

• Properties	Displays the number of FRU devices in the system and the number being displayed. Only FRU devices with valid FRU areas are displayed.
• Reload	Refreshes the display by reading the current FRU entries from the server.
• Sort By	Sorts the displayed events by event number, time stamp, sensor type and number, event description, or event generator ID.

Viewing Sensor Data Records

To view the Sensor Data Records (SDR):

1 From the SSU Main window, choose **SDR Manager**.

When you start the SDR Manager, it automatically loads the SDR entries from nonvolatile memory.

The SDR Manager window has a navigation pane on the left that displays, in a tree format, the sensor data records. The tree has categories for each type of record. Clicking on a category expands or collapses a list of SDRs for that category. Clicking on an individual SDR displays the information for that SDR in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected SDR type.

2 Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all the columns.

3 Use the File and SDR menu items to work with the SDR information:

• Open	Views data from a previously saved SDR file.
• Save As	Saves the currently loaded SDR data to a file.
• Properties	Displays information about the SDR, including IPMI version, number of SDR entries, time stamps for changes to the SDR information, and free space remaining.

- Reload	Refreshes the display by reading the SDR data from the server.

Updating system firmware and BIOS

Using the SSU, you can update the BIOS, update the firmware, and verify the firmware. You can also update the BIOS and firmware without using the SSU.

For detailed update instructions, refer to “BIOS updates” on page 191 and to “Firmware updates” on page 192.

To verify the firmware

To compare the system firmware in nonvolatile memory with a firmware file:

1 Download the update from the Intel support website.

2 From the SSU Main window, choose **System Update**.

Note: System Update is available only in Expert mode.

3 When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

4 From the File menu, choose **Load** and choose a .hex file to use for the update.

5 Click the Verify button to compare the firmware code in nonvolatile storage with the selected file.

Saving and restoring the system configuration

Using the SSU, you can save the following configuration information to a file:

- Platform type, BIOS revision, and firmware revision
- CMOS settings
- Extended system configuration data (ESCD)
- Settings for the emergency management port (EMP), platform event paging (PEP), and BMC LAN alerts

Data is saved from all sources. There is no way to choose only certain pieces of configuration data to save. You can also restore the information from a saved configuration file.

Note: BIOS passwords are stored in the file. Restoring a configuration can change passwords on a server. EMP and LAN passwords are not stored in the file.

To save the system configuration

1 From the SSU Main window, choose **Config Save/Restore**.

Note: Configuration Save/Restore is available only in Expert mode.

2 Click **Save To File** and specify a filename and location.

To restore the system configuration

1 From the SSU Main window, choose **Config Save/Restore**.

Note: Configuration Save/Restore is available only in Expert mode.

2 Click **Restore from File** and specify a filename and location.

The CSR reads the platform type, BIOS revision, and firmware revision from the file and compares that information with the same information retrieved from the server. If the two do not match, an error message is displayed and the restore operation aborts. If they do match, the CSR restores the configuration data to the server. It prompts you to reboot the server for the new settings to take effect.

Alerting for platform events

You can set up the server to alert you when various events occur. Alerts can be delivered either as telephone pages or over the LAN. Instructions for setting up both telephone paging alerts and LAN alerts are explained in the following sections.

To set up paging alerts

To set up the server to send alerts as telephone pages:

1 Install an external modem on the Emergency Management Port (COM2).

2 From the SSU Main window, choose **Platform Event Manager** (PEM).

3 In the PEM window, click **Configure EMP**.

4 In the corresponding boxes, enter the following command strings for the modem attached to the EMP port:

•	ESC Sequence	The escape sequence. This string is sent to the modem before sending command strings. The maximum length for the string is five characters; longer strings are truncated.
•	Hangup String	The string to hang up or drop the connection. The EMP automatically sends an <ENTER> character following this string. The maximum length for the string is eight characters; longer strings are truncated.
•	Modem Dial Command	The command to dial a phone number. This string is sent to the modem before sending the paging string.
•	Modem Init String	The initialization string for the modem. This string is sent every time the EMP initializes. The maximum length for the string is determined at run-time from firmware. You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.

5 Click **Save** to save the changes.

6 Click **Close** to return to the PEM window.

7 In the PEM window, click **Configure PEP**.

8 Select the Enable PEP check box.

9. In the Blackout Period box, enter the minimum time, in minutes, between successive pages. The valid range is [0 - 255] where 0 disables the blackout period.

   Setting a blackout period can save you from being flooded with repeat pages. After you receive a PEP page, no additional pages are sent by PEP for the duration of the blackout period.

10. In the Paging String box, enter the phone number to dial for the page and the message you want sent with the page. The maximum length for the paging string is determined at run-time from the firmware.

    You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.

11. From the Options menu, choose **Configure Event Actions**.
12. In the Platform Event Paging Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:

• >>	Moves all events from the enabled list to the disabled list.
• >	Moves the selected event from the enabled list to the disabled list.
• <	Moves the selected event from the disabled list to the enabled list.
• <<	Moves all events from the disabled list to the enabled list.

13. Click **Save** to save the changes.
14. Click **Close** to return to the PEP Configuration window.
15. To send a test page to verify that you have correctly configured PEP, from the Options menu, choose **Send Alert**.
16. Click **Save** to save the configuration.
17. Click **Close** to return to the Platform Event Manager window.

To set up LAN alerts

To set up the server to send alerts over the LAN:

1 Configure the remote system to receive alerts.

For more information, see the documentation for ASMe.

2 From the SSU Main window, choose **Platform Event Manage**r (PEM).

3 In the PEM window, click **Configure LAN**.

4 Select the Enable LAN Alerts check box.

5 (Optional) In the SNMP Community String box, enter a string for the community field in the Header section of the SNMP trap sent for an alert. The string must be from 5 to 16 characters. The default string is public.

6 In the IP Setup box, choose either:

• DHCP	The IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
• Static	Assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.

7 If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:

• Host IP Address	The IP address of this server.
• Gateway IP Address	The IP address of the router for this server.
• Subnet Mask	The IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.

8 In the Alert IP Address box, fill in the IP address of the system you want to receive alerts from this server.

If you want the alert to be broadcast to an entire subnet, enter the IP address for the subnet.

9 From the Options menu, choose **Configure Event Actions**.

10 In the BMC LAN Alerting Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:

• >>	Moves all events from the enabled list to the disabled list.
• >	Moves the selected event from the enabled list to the disabled list.
• <	Moves the selected event from the disabled list to the enabled list.
• <<	Moves all events from the disabled list to the enabled list.

11 Click **Save** to save the changes.

12 Click **Close** to return to the BMC LAN Configuration window.

13 To send a test alert to verify that you have correctly configured BMC LAN alerts, from the Options menu, choose **Send Alert**.

14 Click **Save** to save the changes.

15 Click **Close** to return to the PEM window.

Managing the server remotely

You can set up the server so that you can connect to it from a remote client system to perform management tasks. You can make the connection over a LAN or by using a modem or direct serial cable to the Emergency Management Port (EMP). Instructions for setting up the server for remote LAN and serial/modem access are given below.

Setting up remote LAN access

To configure remote LAN access:

1 From the SSU Main window, choose **Platform Event Manager** (PEM).

2 In the PEM window, click **Configure LAN**.

3 If you want to require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box.

Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choosing **Clear LAN Password** from the Options menu.)

4 From the LAN Access Mode list, select the remote access mode:

• Full Access	A remote system can initiate a LAN connection regardless of the state or health of the server.
• Restricted	A remote system can initiate a LAN connection, but cannot perform control operations such as power down, reset, or front panel NMI.
• Disabled	Remote systems are not allowed to initiate LAN connections.

5 In the IP Setup box, choose either:

• DHCP	The IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
• Static	Assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.

6 If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:

• Host IP Address	The IP address of this server.
• Gateway IP Address	The IP address of the router for this server.

•	Subnet Mask	The IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.

7 Click **Save** to save the changes.

8 Click **Close** to return to the PEM window.

Setting up remote modem or serial access

To configure remote modem or serial access:

1 From the SSU Main window, choose **Platform Event Manager** (PEM).

2 In the PEM window, click **Configure EMP**.

3 If you want to require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box.

Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choosing **Clear LAN Password** from the Options menu.)

4 In the Modem Ring Time box, enter the number of 500ms intervals that the BMC should wait before taking control of the COM2 port and answering an incoming call.

A value greater than zero gives the BIOS time to answer before the BMC takes control. A value of zero causes the BMC to answer immediately. The maximum value, 63, tells the BMC to ignore the call. Modem Ring Time applies only to Preboot access mode and is ignored for other access modes.

5 In the System Phone Number box, enter the number for the phone line connected to the modem on the EMP.

6 From the Access Mode list, choose the remote access mode:

•	Always Active	The EMP is available at any time.
•	Preboot	The EMP is available only when the server is powered down or is in the running POST during startup.

• Disabled	Remote systems are not allowed to initiate connections.

7 From the Restricted Mode list, choose either:

• Enabled	A remote system can initiate a connection, but cannot perform control operations such as power down, reset, or front panel NMI.
• Disabled	The remote system has full control of the server.

8 From the Connection Mode list, choose either:

• Direct Connect	The COM2 port on the server is connected by a serial cable to the remote system.
• Modem Connect	The COM2 port on the server is connected to a modem.

9 Click **Save** to save the changes.

10 Click **Close** to return to the PEM window.

Exiting the SSU

Exiting the SSU closes all SSU windows.

FRU/SDR load utility

The Field Replacement Unit (FRU) and Sensor Data Record (SDR) load utility is a DOS-based program used to update the server management subsystem's product level FRU and SDR nonvolatile storage. The utility:

- Discovers the product configuration based on instructions in a master configuration file
- Displays the FRU, SDR, and SMB information
- Updates the nonvolatile storage managed by the BMC that holds the SDR and FRU area
- Generically handles FRU devices that might not be associated with the BMC

When to run the FRU/SDR load utility

You'll need to run the FRU/SDR utility in these situations:

- When first setting up your server
- Whenever you change the number of power supplies, processors, or fans in the server
- When installing a FRU/SDR update (page 193)

Note: If the FRU/SDR configuration information in BMC nonvolatile storage does not match the physical configuration of the server, you might see false errors generated by sensors that don't actually exist, and sensors that do exist might not be monitored. So, it is important to keep the configuration up to date.

Running the FRU/SDR load utility

You can run the utility directly from the Utilities menu of the System CD. However, if you have downloaded an update, you should run the updated version from the update diskette.

The executable file for the utility is FRUSDR.EXE. The utility requires the following:

- ROM-DOS version 6.22 or MS-DOS version 6.22 (and later versions)

- One or more .fru files describing the system's field replaceable units
- A .cfg file describing the system configuration
- An .sdr file describing the sensors in the system

Command line format

The basic command line format is:

```
FRUSDR [-?] [-h] [-d {fru, sdr, smb}] [-cfg filename.cfg] [-fru filename.fru]
```

Option	Description
-? or -h	Display usage information.
-d {fru, sdr, smb}	Display requested area only.
-cfg filename.cfg	Updates the FRU and SDR configuration using a CFG file.
-fru filename.fru	Updates the FRU configuration using a FRU file.
-p	Pause between blocks of data.

The FRU/SDR load utility allows only one of the command line options ?, h, d, fru, or cfg at a time. You can use the p flag with any of the other options. You can use either a slash (/) or a minus sign (-) to specify command line options.

Displaying a given area

When the utility is run with the -d option, information about the specified area is read from memory and displayed. If the given display function fails because of an inability to parse the data present or a hardware failure, the utility displays an error message and exits.

Using a specified CFG file

In most cases, you'll use the standard configuration file master.cfg that is supplied with the utility on the System CD and with software updates:

```
FRUSDR -cfg master.cfg
```

The utility loads the specified CFG file and uses the information in that file to:

- Verify that the CFG file is the correct one for the hardware model
- Load the data from the FRU files, prompting the user for information as necessary
- Select the proper SDRs and load them into nonvolatile storage

Using a specified FRU file

If you run FRUSDR using the master.cfg file, and FRUSDR halts prematurely, you can update individual FRU areas by using the -fru switch and a specific FRU file.

Note: FRUSDR, when run using the -fru switch, does not check to make sure it is running on the correct hardware for the specified FRU file. The -fru switch causes FRUSDR to overwrite all information in the specified FRU area.

Updating nonvolatile storage areas

The .fru and .sdr files are specific to a particular server platform. The files include header information to identify the platform. The utility verifies that a file is being used with the correct server before updating any information in nonvolatile storage. Prior to updating the SDR information, the SDR area in nonvolatile storage is cleared.

SCSI*Select*

The Altos G900 system includes an onboard Adaptec® SCSI controller with two SCSI channels (A and B). The host adapter includes an onboard Adaptec® SCSI*Select* configuration utility that allows you to view and configure the settings of the host adapter and devices in the server. This includes changing default values, checking and changing SCSI device settings that might conflict with those of other devices in the server, and performing a low-level format on SCSI devices installed in the server.

Note: The SCSI*Select* utility is only available if the onboard SCSI controller is enabled in BIOS setup.

Use SCSI*Select* to:

- Change default values
- Check and change SCSI device settings that might conflict with those of other devices in the server
- Do a low-level format on SCSI devices installed in the server

Running SCSI*Select*

To run the SCSI*Select* utility:

1 During POST, press **Ctrl** + **A** to run the utility when this message appears on the video monitor:

```
<<<Press <Ctrl><A> for SCSISelect(TM) Utility!>>>
```

When the main menu for the host adapter appears, follow the instructions on screen to configure the controller settings or format drives on each SCSI channel.

Software updates

Your system comes with preinstalled firmware for the system BIOS, baseboard management controller (BMC), and hot-swap controller (HSC). A FRU/SDR load utility is included on the System CD.

Updates are available in two forms:

- A software update package (SUP) containing all updates (BIOS, BMC, HSC, and FRU/SDR)
- Individual files, one for each update

To use either form of update, you must create bootable diskettes. The procedure for creating bootable diskettes is described in the following section. SUPs are discussed on page 190 and individual updates on page 191.

Creating bootable diskettes

To use diskettes for updates, you must format them as system or bootable diskettes with ROM-DOS version 6.22 or later or MS-DOS version 6.22 or later.

Note: It is recommended that you create bootable diskettes by booting the target system from the System CD. However, the process for making the diskettes is the same for all compatible versions of DOS. ROM-DOS version 6.22 is included on the System CD.

To format a diskette as a bootable diskette

1 Boot to the System CD.

2 Exit from the menu to a DOS prompt.

3 Insert a diskette into the floppy drive.

4 At the DOS prompt, for an unformatted diskette, type:

```
format a:/s
```

or, for an already formatted diskette, type:

```
sys a:
```

5 Press **Enter**.

Software update packages

A Software Update Package (SUP) contains all the necessary files to perform BIOS, BMC, HSC, and FRU/SDR, or other software updates.

To install a software update package

1. Download the software update along with any ReadMe, Release Notes, and other files listed on the Web page for the update.
2. Print and read the ReadMe, Release Notes, and any other text or document files that came with the update. The files from the Web page contain the latest information and instructions for the update, which supersedes the information in this user's guide.
3. Record the current BIOS settings.
   - a Boot the server and press **F2** when you are prompted to do so.
   - b Write down the current settings in the BIOS setup utility.
4. Follow the installation instructions that came with the update.

   Note: Do not turn off the system during the update process.

5. When the update is complete, use BIOS setup to reconfigure any custom settings.

   For more information on the BIOS setup utility, refer to page 113.

Individual updates

This section gives procedures for performing individual updates of the BIOS, BMC or HSC firmware, and FRU/SDR data.

BIOS updates

The IFLASH utility is a DOS-based utility used to install BIOS updates. IFLASH.EXE is included with the BIOS update file.

To update the BIOS:

1. Download the software update along with any ReadMe, Release Notes, and other files listed on the Web page for the update.
2. Print and read the ReadMe, Release Notes, and any other text or document files that came with the update. The files from the Web page contain the latest information and instructions for the update, which supersedes the information in this User's guide.
3. Record the current BIOS settings.
    a. Boot the server and press **F2** when you are prompted to do so.
    b. Write down the current settings in the BIOS setup program.
4. Follow the installation instructions that came with the update.
5. When the update is complete, use BIOS setup to reconfigure any custom settings.

   For more information on the BIOS setup, refer to page 113.

Recovering the BIOS

In the rare event that the BIOS update fails and the BIOS is corrupted, you will need to recover the BIOS. The Release Notes or other documentation that you downloaded with the BIOS update explain the steps for recovering the BIOS. The procedure requires you to install one or more jumpers temporarily. For the location of the jumpers and help in identifying the correct jumper pins, see “Mainboard jumpers” on page 15.

Changing the BIOS language

You can use the BIOS update utility to change the language used for text in the BIOS setup user interface:

1. Insert the diskette holding the BIOS update files into the floppy drive and boot the server.
2. Follow the instructions that appear on the screen, choosing to update the language files.
3. When the utility finishes updating the BIOS, remove the diskette from floppy drive and reboot the system.

Firmware updates

The Firmware Update Utility is a DOS-based program used to update the BMC and HSC firmware code. You need to run the utility only if a new firmware code is necessary. The utility is included with the firmware update file.

To update the firmware:

1. Download the firmware update along with any ReadMe, Release Notes, and other files listed on the Web page for the update.
2. Print and read the ReadMe, Release Notes, and any other text or document files that came with the update. The files from the Web page contain the latest information and instructions for the update, which supersedes the information in this User's guide.
3. Follow the installation instructions that came with the update.
4. After the update is complete, if you are updating the BMC firmware, disconnect the AC power cord from the system and wait for 60 seconds.
5. Follow the installation instructions that came with the update.

   Note: To complete the update of the BMC firmware, you must disconnect the AC power cord to remove the standby power from the BMC. Removing the standby power forces the BMC to reset, which is necessary to complete the update.

6. Reconnect the AC power cord and power up the system.

7 If you are updating the BMC firmware, run the FRU/SDR load utility.

For more information on the FRU/SDR load utility, refer to page 185.

FRU/SDR updates

The Field Replacement Unit (FRU) and Sensor Data Record (SDR) load utility is a DOS-based program used to update the server FRU and SDR configuration. The utility is included with the update file.

To update the FRU/SDR configuration:

1 Download the software update along with any ReadMe, Release Notes, and other files listed on the Web page for the update.

2 Print and read the ReadMe, Release Notes, and any other text or document files that came with the update. The files from the Web page contain the latest information and instructions for the update, which supersedes the information in this User's guide.

3 Follow the installation instructions that came with the update.

Appendix C: Equipment log and configuration worksheets

This appendix shows sample sheets for recording information about the system. Procedures for calculating the system's power consumption is also discussed.

Equipment log

Use the blank equipment log provided here to record information about the system. Some of this information might be required when running the System Setup Utility (SSU).

Item	**Manufacturer name and model number**	**Serial number**	**Date installed**
System			
Server board set			
Processor (speed and cache)			
Video display			
Keyboard			
Mouse			
Diskette drive A			
CD-ROM drive (5.25-inch peripheral drive 1)			
5.25-inch peripheral drive 2			
5.25-inch peripheral drive 3			
Hard drive 1			
Hard drive 2			
Hard drive 3			
Hard drive 4			
Hard drive 5			

Calculating power consumption

The total combined wattage for the system configuration must be less than the output of your power supplies. Use the two worksheets in this section to calculate the power used by your system. For current and voltage requirements of add-in boards and peripherals, refer to the vendor documents.

Calculating DC power usage

1. List the current for each board and device in the appropriate voltage level column in the Power Usage Worksheet 1.
2. Add the currents in each column then go to the next worksheet.

Power Usage Worksheet 1					
Device	**Current (maximum) voltage level**				
	+3.3 V	**+5 V**	**5 V Standby**	**+12 V**	**-12 V**
Server board set					
Primary processor					
Second processor					
Third processor					
Fourth processor					
Memory					
PCI slot 1					
PCI slot 2					
PCI slot 3					
PCI slot 4					

Power Usage Worksheet 1					
Device	**Current (maximum) voltage level**				
	+3.3 V	**+5 V**	**5 V Standby**	**+12 V**	**-12 V**
PCI slot 5					
PCI slot 6					
PCI slot 7					
PCI slot 8					
1st 3.5-inch hard disk drive					
2nd 3.5-inch hard disk drive					
3rd 3.5-inch hard disk drive					
4th 3.5-inch hard disk drive					
5th 3.5-inch hard disk drive					
3.5-inch diskette drive					
CD-ROM drive					
2nd 5.25-inch peripheral drive					

Power Usage Worksheet 1					
Device	**Current (maximum) voltage level**				
3rd 5.25-inch peripheral drive					
	+3.3 V	**+5 V**	**5 V Standby**	**+12 V**	**-12 V**
Fans					
Total Current					

Calculating the total combined power used by the system

1 From the previous worksheet, enter the total current for each column in the Power Usage Worksheet 2.

2 Multiply the voltage by the total current to get the total wattage for each voltage level.

3 Add the total wattage for each voltage level to arrive at the total combined power usage of the power supply.

Power Usage Worksheet 2	
Voltage level and total current (V x A = W)	**Total Watts for each voltage level**
(+3.3 V) x (______ A)	________ W
(+5 V) x (______ A)	________ W
(-5 V) x (______ A)	________ W
(+12 V) x (______ A)	________ W
(-12 V) x (______ A)	________ W
Total Combined Wattage	________ W

Appendix D:

Troubleshooting

This appendix helps you identify and solve problems that might occur while you are using the system.

Troubleshooting

The subsequent sections discuss items you will find useful in managing common system problems. Read it before calling a technician if a problem occurs. Solutions to more serious problems require opening up the system. Do not attempt to open the system by yourself. Contact your dealer or an authorized service center for assistance.

Resetting the system

To do this:	Press:
Clear system memory, restart POST, and reload the operating system.	Reset button
Cold boot reset, which clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals.	Power off/on

Initial system startup

Incorrect installation or configuration usually causes problems that occur at initial system startup. Hardware failure is a less frequent cause. Check the following:

- Are all cables correctly connected and secured?
- Are the processors fully seated in their sockets on the processor board?
- Are all PCI add-in boards fully seated in their slots on the mainboard?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation. If applicable, ensure that there are no conflicts, for example, two add-in boards sharing the same interrupt.
- Are all DIMMs installed correctly?
- Are all peripheral devices installed correctly?

- Are hard disk drives properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made with the SSU correct?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Did you press the system power on/off button on the front panel to turn the server on (the power-on light should be lit)?
- Are the system power cords properly connected to the system and plugged into a NEMA 6-15R outlet for 100-120 V~ or for 200-240 V~?
- Is AC power available at the wall outlet?

If all items are correct and problems persist, contact your service representative or authorized dealer for assistance.

Running new application software

Problems that occur when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly.

Application software checklist

- Does the system meet the minimum hardware requirements for the software? See the software documentation.
- If you are running the software from a diskette, were the files copied to the diskette correctly?
- If you are running the software from a CD-ROM disc, is the disc scratched or dirty?
- If you are running the software from a hard drive, is the software correctly installed? Were all necessary procedures followed and all required files installed?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?

If problems persist, contact the software vendor's customer service representative.

After the system has been running correctly

Problems that occur after the system has been running correctly with no hardware or software changes often indicate equipment failure. However, recent changes made to the system, such as hardware or software that has been added or removed, might also be the source of the problems. Check the following:

- If you are running the software from a diskette, try a new copy of the software.
- If you are running the software from a CD-ROM disc, try a different disc to see if the problem occurs on all discs.
- If you are running the software from a hard drive, try running it from a diskette. If the software runs correctly, there might be a problem with the copy on the hard drive. Reinstall the software on the hard disk, and try running it again. Make sure all necessary files are installed.
- If the problems are intermittent, there might be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other intermittent component failures.
- If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.

If all items are correct and problems persist, contact your service representative or authorized dealer for assistance.

Monitoring POST

When you turn on the system, POST displays messages that provide information about the system. If a failure occurs, POST emits beep codes that indicate errors in hardware, software, and firmware. If POST can display a message on the video display, the speaker beeps twice as the message appears. For a complete list of errors and codes, refer to page 215.

Verifying proper operation of key system lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As POST checks each device, the activity light for that device should turn on briefly. Check for the following:

- Does the diskette drive activity light turn on briefly? If not, see "Diskette drive activity light does not light" on page 211.
- Does the hard disk drive activity light on the control panel turn on briefly? If not, see "Hard drive activity light does not light" on page 211.

Confirming loading of an operating system

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see "Initial system startup" on page 205.

Frequently asked questions (FAQs)

This section provides possible solutions for specific problems. Try the solutions in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for assistance.

Power light does not light

Check the following:

- Are all the power supplies plugged in? Is the power turned on to the power strip or outlet? Do you have a blown fuse or breaker?
- Is the system functioning normally? If so, the power LED might be defective, the cable from the front panel to the fan carrier board might be loose, or the cable from the fan carrier board to the mainboard might be loose.
- Are there other problems with the system? If so, check the items listed under "System cooling fans do not rotate properly" on page 210.

If all items are correct and problems persist, contact your service representative or authorized dealer for assistance.

No beep codes

If the system operates normally, but there was no beep, the speaker might be defective. If the speaker is enabled, but the speaker does not function, contact your service representative or authorized dealer for assistance.

No characters appear on screen

Check the following:

- Is the keyboard working? Check to see that the "Num Lock" light is functioning.
- Is the video monitor plugged in and turned on? Many modern video monitors shut down when inactive and might require a moment to warm up when activated.
- Are the brightness and contrast controls on the video monitor properly adjusted?

- Are the video monitor switch settings correct?
- Is the video monitor signal cable properly installed?
- Is the onboard video controller enabled?
- If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in the PCI add-in board connector (and verify that the video monitor is plugged in to the active video controller).
2. Reboot the system for changes to take effect.
3. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.

   If you do not receive a beep code and characters do not appear:

   - The video display monitor or video controller might have failed. You can verify this by trying the monitor on another system or trying a different monitor on this system.
   - The system did not find any valid memory installed. Verify that you are using the correct type of memory for the system and that you have installed it correctly. Refer to page 52.

Characters are distorted or incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer's documentation.
- Are the video monitor signal and power cables properly installed?
- Is the correct monitor/video board installed for your operating system?

If the problem persists, the video monitor might be faulty or it might be the incorrect type. Contact your service representative or authorized dealer for assistance.

System cooling fans do not rotate properly

If the system cooling fans are not operating properly, system components could be damaged.

If the system power LED is on, but the fans are not rotating properly, check the following:

- Are any of the fan fault indicators lit? Is so, try replacing the corresponding fan module.
- Is the cable from the fan carrier board connected to the mainboard?
- Are the power supply cables properly connected to the mainboard and the fan carrier board assembly?
- Are there any shorted wires caused by pinched cables or power connector plugs forced into power connector sockets the wrong way?

  If the connections are correct, contact your service representative or authorized dealer for assistance.

Diskette drive activity indicator does not light

Check the following:

- Are the diskette drive power and signal cables properly installed?
- Are all relevant switches and jumpers on the diskette drive set correctly?
- Is the diskette drive properly configured?
- Is the diskette drive activity light always on? If so, the signal cable might be plugged in incorrectly.
- If you are using the onboard diskette controller, use BIOS setup (page 113) to make sure that "Onboard Floppy" is set to "Enabled."
- If you are using an add-in diskette controller, make sure that "Onboard Floppy" is set to "Disabled."

If the problem persists, there might be a problem with the diskette drive, mainboard, or drive signal cable. Contact your service representative or authorized dealer for assistance.

Hard drive activity indicator does not light

If you have installed one or more hard drives in your system, check the following:

- Are the power and signal cables to the drive properly installed?

- Are all relevant switches and jumpers on the hard drive and adapter board set correctly?
- Is the hard drive properly configured?

Note: The front panel hard disk indicators are for SCSI devices. The hard drive activity indicator on the front panel lights when a SCSI device controlled by the onboard SCSI host controller is in use. This indicator does not display CD-ROM activity.

CD-ROM drive activity indicator does not light

Check the following:

- Are the power and signal cables to the CD-ROM drive properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?
- Is the onboard IDE controller enabled in the BIOS?

Network problems

The server hangs when the drivers are loaded.

- Change the PCI interrupt settings.

Diagnostics pass, but the connection fails.

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in the NET.CFG file.

The Link LED does not light.

- Make sure you have loaded the network drivers.
- Check all cable connections.
- Try another port on the hub or switch.
- Make sure you have the correct type of cable between the adapter and the hub or switch. Some hubs and switches require a crossover cable while others require a straight through cable. For more information on crossover cabling, see your hub or switch documentation.

The activity indicator doesn't light.

- Make sure you've loaded the correct network drivers.
- The network might be idle. Try accessing a server.

The onboard network interface controller (NIC) stopped working when an add-in adapter was installed.

- Make sure the cable is connected to the port from the onboard NIC.
- Make sure your PCI BIOS is current.
- Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts; OS/2 does not.
- Try reseating the add-in adapter.

The add-in adapter stopped working without apparent cause.

- Try reseating the adapter first; then try a different slot if necessary.
- The network driver files might be corrupt or deleted. Delete and then reinstall the drivers.
- Run the diagnostics.

PCI installation problems

Check the following:

- Some drivers might require interrupts that are not shared with other PCI drivers. The SSU can be used to adjust the interrupt numbers for PCI devices. For certain drivers, it might be necessary to alter settings so that interrupts are not shared.
- Check PCI interrupt interdependencies among slots and onboard devices.

Problems with application software

If you have problems with application software, do the following:

- Verify that the software is properly configured for the system. See the software installation and operation documentation for instructions on setting up and using the software.

- Try a different copy of the software to see if the problem is with the copy you are using.
- Make sure all cables are installed correctly.
- If other software runs correctly on the system, contact your vendor about the failing software.

If the problem persists, contact the software vendor's customer service representative for assistance.

Bootable CD-ROM is not detected

Check the following:

- Is the BIOS set to allow the CD-ROM to be the first bootable device?
- Are the jumpers on the CD-ROM drive set correctly?
- Are the power and data cables connected properly?

Appendix E: Codes and error messages

This appendix includes tables of codes and error messages that may be encountered when operating the system.

Standard BIOS post codes

The table below lists the port-80 codes displayed during the boot process. A beep code is a series of individual beeps on the PC speaker, each of equal length. The table describes the error conditions associated with each beep code and the corresponding POST check point code as seen by a port 80h card. For example, if an error occurs at checkpoint 22h, the BIOS issues the beep code 1-3-1-1.

CP	Beeps	Reason
02		Verify real mode
04		Get processor type
06		Initialize system hardware
08		Initialize chipset registers with initial POST values
09		Set in POST flag
0A		Initialize processor registers
0B		Enable processor cache
0C		Initialize caches to initial POST values
0E		Initialize I/O
0F		Initialize the local bus IDE
10		Initialize power management
11		Load alternate registers with initial POST values
12		Restore processor control word during warm boot
14		Initialize keyboard controller

CP	Beeps	Reason
16	1-2-2-3	BIOS ROM checksum
18		8254 timer initialization
1A		8237 DMA controller initialization
1C		Reset Programmable Interrupt Controller
20	1-3-1-1	Test DRAM refresh
22	1-3-1-3	Test 8742 keyboard controller
24		Set ES segment register to 4 GB
28	1-3-3-1	Autosize DRAM, system BIOS stops execution here if the BIOS does not detect any usable memory DIMMs
2A		Clear 8 MB base RAM
2C	1-3-4-1	Base RAM failure, BIOS stops execution here if entire memory is bad
32		Test processor bus-clock frequency
34		Test CMOS
35		RAM initialize alternate chipset registers
36		Warm start shut down
37		Reinitialize the chipset
38		Shadow system BIOS ROM
39		Reinitialize the cache
3A		Autosize cache
3C		Configure advanced chipset registers
3D		Load alternate registers with CMOS values
40		Set initial processor speed new

CP	Beeps	Reason
42		Initialize interrupt vectors
44		Initialize BIOS interrupts
46	2-1-2-3	Check ROM copyright notice
47		Initialize manager for PCI Option ROMs
48		Check video configuration against CMOS
49		Initialize PCI bus and devices
4A		Initialize all video adapters in system
4B		Display QuietBoot screen
4C		Shadow video BIOS ROM
4E		Display copyright notice
50		Display processor type and speed
52		Test keyboard
54		Set key click if enabled
55		USB initialization
56		Enable keyboard
58	2-2-3-1	Test for unexpected interrupts
5A		Display prompt "Press F2 to enter SETUP"
5C		Test RAM between 512 and 640K
60		Test extended memory
62		Test extended memory address lines
64		Jump to UserPatch1
66		Configure advanced cache registers
68		Enable external and processor caches

CP	Beeps	Reason
6A		Display external cache size
6B		Load custom defaults if required
6C		Display shadow message
6E		Display non-disposable segments
70		Display error messages
72		Check for configuration errors
74		Test real-time clock
76		Check for keyboard errors
7A		Test for key lock on
7D		Intelligent system monitoring
7E		Test coprocessor if present
82		Detect and install external RS232 ports
85		Initialize PC-compatible PnP ISA devices
86		Reinitialize onboard I/O ports
88		Initialize BIOS data area
8A		Initialize extended BIOS data area
8C		Initialize floppy controller
90		Initialize hard disk controller
91		Initialize local bus hard disk controller
92		Jump to UserPatch2
93		Build MPTABLE for multi-processor boards
94		Disable A20 address line
95		Install CD-ROM for boot

CP	Beeps	Reason
96		Clear huge ES segment register
98	1-2	Search for option ROMs. One long, two short beeps on checksum failure
9A		Shadow option ROMs
9C		Set up power management
9E		Enable hardware interrupts
A0		Set time of day
A2		Check key lock
A4		Initialize typematic rate
A8		Erase F2 prompt
AA		Scan for F2 key stroke
AC		Enter SETUP
AE		Clear in-POST flag
B0		Check for errors
B2		POST done - prepare to boot operating system
B4	1	One short beep before boot
B5		Display MultiBoot menu
B6		Check password, password is checked before option ROM scan
B7		ACPI initialization
B8		Clear global descriptor table
BC		Clear parity checkers
BE		Clear screen (optional)
BF		Check virus and backup reminders

CP	Beeps	Reason
C0		Try to boot with INT 19
C8		Forced shutdown
C9		Flash recovery
DO		Interrupt handler error
D2		Unknown interrupt error
D4		Pending interrupt error
D6		Initialize option ROM error
D8		Shutdown error
DA		Extended Block Move
DC		Shutdown 10 error

Recovery BIOS POST codes

The table below lists the port-80 codes displayed during a recovery boot process.

CP	**Reason**
E0	Initialize chip set
E1	Initialize bridge
E2	Initialize processor
E3	Initialize timer
E4	Initialize system I/O
E5	Check forced recovery boot
E6	Validate checksum
E7	Go to BIOS
E8	Initialize processors
E9	Set 4 GB segment limits
EA	Perform platform initialization
EB	Initialize PIC and DMA
EC	Initialize memory type
ED	Initialize memory size
EE	Shadow boot block
EF	Test system memory
F0	Initialize interrupt services
F1	Initialize real time clock
F2	Initialize video
F3	Initialize beeper

CP	Reason
F4	Initialize boot
F5	Restore segment limits to 64 KB
F6	Boot mini DOS
F7	Boot full DOS

BMC beep codes

The table below lists the beep codes generated by the BMC.

Beeps	Reason
1-5-1-1	FRB failure (processor failure)
1-5-4-2	Power fault: DC power unexpectedly lost (power control failures)
1-5-4-3	Chipset control failure
1-5-4-4	Power control fault

POST error messages and codes

The table below lists POST error codes and their associated messages. The BIOS prompts the user to press a key in case of serious errors. Some of the error messages are preceded by the string "Error" to highlight the fact that these indicate a system that might be malfunctioning. All POST errors and warnings are logged in the system event log.

Code	Error Message	Failure Description
0200:	Failure Fixed Disk	Hard disk error
0210:	Stuck Key	Keyboard connection error
0211:	Keyboard error	Keyboard failure
0212:	Keyboard Controller Failed	Keyboard controller failed
0213:	Keyboard locked - Unlock key switch	Keyboard locked
0220:	Monitor type does not match CMOS - Run SETUP	Monitor type does not match CMOS
0230:	System RAM Failed at offset	System RAM error offset address
0231:	Shadow RAM Failed at offset	Shadow RAM failed offset address
0232:	Extend RAM Failed at address line	Extended RAM failed offset address
0233:	Memory type mixing detected	Memory type mixing detected
0234:	Single - bit ECC error	Memory 1 bit error detected
0235:	Multiple- bit ECC error	Memory multiple-bit error detected
0250:	System battery is dead - Replace and run SETUP	NVRAM battery dead

Code	Error Message	Failure Description
0251:	System CMOS checksum bad - Default configuration used	CMOS checksum error
0252:	Password checksum bad - Passwords cleared	
0260:	System timer error	System timer error
0270:	Real time clock error	RTC error
0271:	Check date and time setting	RTC time setting error
02B0:	Diskette drive A error	
02B2:	Incorrect Drive A type - run SETUP	Incorrect drive A type
02D0:	System cache error - Cache disabled	CPU cache error
0B00:	Rebooted during BIOS boot at Post Code	
0B1B:	PCI System Error on Bus/ Device/Function	PCI system error in bus/ device/function
0B1C:	PCI Parity Error in Bus/Device/ Function	PCI system error in bus/ device/function
0B50:	Processor 1 with error taken offline	Failed processor 1, error detected.
0B51:	Processor 2 with error taken offline	Failed processor 2, error detected.
0B52:	Processor 3 with error taken offline	Failed processor 3, error detected.
0B53:	Processor 4 with error taken offline	Failed processor 4,n error detected.
0B5F:	Forced to use CPU with error	An error detected in the entire CPU.

Code	Error Message	Failure Description
0B60:	DIMM bank 1 has been disabled	Memory error, memory bank 1 failed
0B61:	DIMM bank 2 has been disabled	Memory error, memory bank 2 failed
0B62:	DIMM bank 3 has been disabled	Memory error, memory bank 3 failed
0B6F:	DIMM bank with error is enabled	An error detected in all the memory
0B70:	The error occurred during temperature sensor reading	Error while detecting a temperature failure.
0B71:	System temperature out of the range	Temperature error detected.
0B74:	The error occurred during voltage sensor reading	Error while detecting voltage
0B75:	System voltage out of the range	System voltage error
0B7C:	The error occurred during redundant power module confirmation	The error occurred while retrieving the power information.
0B80:	BMC Memory Test Failed	BMC device (chip) failed
0B81:	BMC Firmware Code Area CRC check failed	BMC device (chip) failed
0B82:	BMC core Hardware failure	BMC device (chip) failed
0B83:	BMC IBF or OBF check failed	Access to BMC address failed
0B90:	BMC Platform Information Area corrupted.	BMC device (chip) failed
0B91:	BMC update firmware corrupted.	BMC device (chip) failed

Code	Error Message	Failure Description
0B92:	Internal Use Area of BMC FRU corrupted.	SROM storing chassis information failed Available for use except for FRU command and emergency management port function.
0B93:	BMC SDR Repository empty.	BMC device (chip) failed
0B94:	IPMB signal lines do not respond.	SMC (Satellite Management Controller) failed Available for use except for the access function to SMC via IPMB.
0B95	BMC FRU device failure.	SROM storing chassis information failed Available for use except for FRU command and emergency management port function.
0B96	BMC SDR Repository failure.	BMC device (chip) failed
0B97	BMC SEL device failure.	BMC device (chip) failed
0BB0:	SMBIOS - SROM data read error	SROM data read error
0BB1:	SMBIOS - SROM data checksum bad	Bad checksum of SROM data
0BD0:	1st SMBus device address not acknowledged.	Some SMBus device (chip) failed
0BD1:	1st SMBus device Error detected.	Some SMBus device (chip) failed
0BD2:	1st SMBus timeout.	Some SMBus device (chip) failed
	Expansion ROM not initialized.	PCI Expansion ROM card not initialized

Code	Error Message	Failure Description
	Invalid System Configuration Data	System configuration data destroyed
	System Configuration Data Read Error	System configuration data read error
	Resource Conflict	PCI card resource is not mapped correctly.
	System Configuration Data Write error	System configuration data write error
	Warning: IRQ not configured	PCI interrupt is not configured correctly.
8503:	Incorrect memory speed in location: XX, XX, …	Non-PC200 DIMMs have been installed in slots XX, XX, …

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